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GREENHOUSE AND STOVE PLANTS,

FLOWERING AND FINE-LEAVED,

PALMS, FERNS, AND LYCOPODIUMS,

WITH FULL DETAILS OF THE PROPAGATION AND CULTIVATION OF

500 FAMILIES OF PLANTS,

EMBRACING ALL THE BEST KINDS IN CULTIVATION, SUITABLE FOR GROWING
IN THE GREENHOUSE, INTERMEDIATE HOUSE, AND STOVE.

BY THOMAS BAINES.

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PREFACE.

Success in the cultivation of the large number of Stove and Greenhouse Plants now known in British gardens, to a great extent depends on an acquaintance with the particular wants of each individual kind, as not only do many allied species require different treatment, but it frequently happens that individual varieties of the same parentage want something in their management quite different from each other, without which they fail to thrive. With this view, in preparing the accompanying treatise, the intention has been, so far as possible, without resorting to unnecessary repetition, to avoid giving directions that are too general in their application, but rather to state fully the treatment which each species or variety has been found to do best with. In such cases, where several kinds of plants succeed under like conditions, the details are given to one, the others being referred thereto.

In describing the general character and appearance of the plants treated of, Botanical details have been omitted, but the purpose to which each is best adapted, whether for planting out, growing in pots, as roof climbers, or trained specimens, ordinary decorative use, the supply of cut flowers, &c., &c., is given, and this, it is hoped, will assist those but little acquainted with plants in the selection of the kinds best suited to their requirements.

The best new plants that have appeared up to date are included, as well as the large numbers of older kinds possessing sterling merit. When any plant holds a relatively inferior position, this is stated in the description accompanying it. Notes are given of the particular kinds of insects each species is subject to, and instructions as to the safest means for their destruction; also, hints on the form, construction, and heating of Greenhouses and Stoves.

Cultural details on a portion of the plants here treated of have appeared in "The Garden" and "The Gardeners' Chronicle"; these have been revised and added to so far as found necessary.

T. B.

GREENHOUSE AND STOVE PLANTS.

GREENHOUSE PLANTS.

General Remarks.

The vast numbers of species and varieties of greenhouse plants, hard and soft wooded, now in cultivation, afford an all but limitless field for the cultivator to select from. Australia, with its wide expanse of territory, China, the Cape of Good Hope, the temperate parts of America, Southern Europe, and the cool mountain ranges of the various hot countries of the world, have all been put under contribution to furnish our greenhouses with plants that keep up through the circle of the year an unbroken succession of flowers in their varied forms and colours. The advantage which greenhouse plants present to the general cultivator is their requiring little artificial heat beyond that requisite to keep them during the winter somewhat above the reach of frost, with the consequently more enjoyable temperature of the structures in which they are located in the growing season than is possible with the stove. Amongst the hardwooded occupants of the greenhouse are many of the most beautiful, distinct, and profuse flowering plants in existence; these properties collectively commend them to the general cultivator. The better known, and more easily managed, softwooded section, contribute so much by the beauty and abundance of their flowers to the embellishment of greenhouses and conservatories, and play so important a part in the all but limitless arrangements in which flowers and plants are now used, that nothing further need be said in their favour beyond instancing the ease with which they may be grown,—which ease alone is worth taking into consideration.

Position, Form, and Construction of House.—It is a matter of the first importance that greenhouses should be situated far enough away from anything that can in the least obstruct or absorb the light which, to the fullest extent possible, is essential to the well-being of greenhouse plants. Trees, or any dark object, even when situated on the north side of a planthouse (unless at some distance from it) absorb the light to an extent that seriously reduces the amount which reaches the plants; consequently care should be taken to build far enough away from such. For a like reason, to secure the inmates all the light possible, on all sides, the span shape is much the best; a house of this description, 18 to 20 feet wide by from 40 to 50 feet in length, is proportionate and convenient, as well as generally suited to the requirements of the plants. It should consist of 3 feet of brickwork all round; the upright side-lights should be 2 ft. 6 in. in depth, all hinged and provided with opening gear, like the roof ventilators. These should consist of short lights running the whole length of the house, hinged to the ridge, so as to open with lever rods; and this is so much an improvement on the old system of sliding lights that air can be given when required in wet weather. It is also infinitely superior to any of the contrivances of shutter-ventilation at the ridge, as these always tend to darken the house too much. The internal arrangement may, with advantage, consist of 3 feet side stages over the pipes, and on a level with the bottom of the side-lights. A path running on each side of the house, about 3½ feet in width, should divide the side stages from the centre, which should consist of a flat stage about the same height as those at the sides, or a few inches higher. Both side and centre stages should be made of solid slabs of slate, thin flags, or iron plates, on which can be placed an inch or so of fine sandy gravel that can be kept damp when required, and will so maintain a nice moisture amongst the plants standing thereon. For small stock especially, and during the growing season, this is a great advantage, preserving a more genial atmosphere, and acting as a preventive against red spider. In such a house two four-inch pipes, flow and return, all round under the outside stages, will be required. For retarding purposes, such as keeping back a portion of the stock of many kinds of plants with a view to prolong the season of their flowering, a lean-to house facing northwards, with wall at back, is a structure that is very useful, and offers advantages that cannot be had with houses fully under the sun's influence. Front lights and top ventilators should be provided and made to work similarly to those advised for the greenhouse.

LIGHT.—In plant life one of the first essentials is light. Certainly there are many things that will exist for a time with an insufficiency of it, and, when completely at rest, some others will bear the complete exclusion of light; but where any activity in vegetable life exists, there light must be present in sufficient quantities to supply the necessities of plants according to their individual requirements. All plants that require the protection of a glass covering, even with only the application of sufficient heat to exclude frost, exist under conditions more or less artificial, and they become to some extent inured to the partial absence of some of the conditions existing when in a state of Nature; but so far as we have been able to observe, under such conditions they require the presence of something to compensate them for the loss they suffer. For instance, any plant grown under glass cannot possibly receive nearly the amount of fresh air it enjoys in its native habitat. Air and light are the elements that strengthen and solidify the soft tender shoots and young immature leaves of growing plants. As the first of these all-essential agents cannot be given in quantities equal to what the plants receive in a state of Nature, we must try to make up for its absence by giving them the greatest possible amount of light. Any one who is at all doubtful as to light being in some measure able to compensate vegetable life for an insufficiency of air, may learn something by noticing plants of several varieties of common British Heath that will grow and luxuriate for years in an Orchid basket hung up within a few inches of the glass. Here all the conditions under which the plants exist naturally are changed, and had it not been for the amount of light they received they would have succumbed. We have long since come to the conclusion that the necessity for giving to that portion of a plant above the soil—its leaves and branches—the greatest possible amount of light is of as great importance as the necessary supply of water to its underground parts, the roots; and that in the class of plants under consideration a great number of failures are attributable, not only to the use of dark, unsuitable houses, but to the fact of the plants not being elevated sufficiently near the glass.

Whilst on the subject of light it will be necessary to say a few words on the position in which plants require to be placed in the houses in which they are grown. Their general wellbeing depends much more upon this than the way in which they are frequently treated in this respect would lead us to suppose. We often see plants in even good light houses standing in such a position as would lead to the impression that the simple fact of their being under the protection of the house was thought sufficient. In conservatories, or houses that are principally kept gay by the temporary introduction of plants whilst in flower, the most effective arrangement must be considered, and the plants placed where and in such manner as will give the best general effect, and during the comparatively short time they occupy such structures, and the little growth that most plants make whilst flowering, if they are not too much crowded they will not receive serious harm. It is in the houses in which the plants make their growth, where they are situated for the greater portion of the year, that it is necessary to so place them that they will receive all the light possible, by elevating them as near to the roof as they can be. This is even more important during the early stages of the plants' existence than when they get larger, for very much of subsequent health depends upon the strength and vigour that a plant acquires during the early stages of its growth. Any one who is in the habit of seeing Covent Garden Market cannot fail to notice the profusion of flowers produced by comparatively small plants. If he has the opportunity of seeing these plants at home with the growers, he will see that through the whole course of their existence the one consideration above all others is, to keep them near the glass. Arranged in this way, whilst plants are small, they certainly have not so nice an effect in the houses they occupy, but their condition as to health and general appearance, when they get to something like the size they are required to be grown to, will fully compensate for this, and will be much more satisfactory than the study of the most effective arrangement in their early stages of growth.

AIR.—The admission of air to greenhouse plants in such quantity as they require at the different seasons, and under the varied conditions of weather in a climate so changeable as ours, is an important matter, and one on which success or failure much depends. A knowledge that plants with few exceptions cannot be kept in health unless they have a considerable amount of air admitted to the houses in which they are grown, frequently leads to much being given when only little, or none at all, should be admitted. To the cold-chilling draughts allowed to sweep through cool plant houses may be attributed much of the stunted, indifferent condition in which the inmates are often seen.

We have never met with a single cultivated plant that could, for any length of time, with impunity be submitted to a draught. Even Heaths, much as they dislike a stagnant atmosphere, will not long bear draughts. Except in mild weather, front air ought never to be given at the same side of the house on which the wind comes—not even in the autumn, when the wood and leaves are hard and ripe. Let any one who has a vigorous growing plant of anything he happens not to care about try the experiment of placing it in a cold draught; then after a time let him examine the roots, and he will find that they are all stagnant, showing at once the sympathy that exists between the leaves and roots of plants.

In the spring especially, when the weather often changes completely in the space of an hour, the intelligent cultivator will at once close the lights on the side of the house where the current comes in, giving air at the opposite side, or none at all according to the external temperature. After the plants begin to move freely in spring, air, proportionate in quantity to the external warmth, should always be given. This should be done early in the morning, before the sun has run up the heat of the house too much, closing betimes in the afternoon before the temperature gets too low. Even in summer we often have winds of such force as to be injurious to plants if the lights are opened much in the direction from which it comes. In warm summer weather air should be given freely through the day, and as the season advances, and growth approaches completion, some should also be given in the nights.

SHADE.—Little shade is required by the generality of greenhouse plants, even in summer, except when they are newly potted, or whilst they are in flower, to preserve the bloom. In all cases it should only be applied when the sun is on the glass. In the case of young stock whilst in small pots, with the consequent liability of the soil to dry up quickly, it is often necessary to use a thin shade during bright weather in summer, but this should always be dispensed with when the sun is not powerful.

WATER.—We now come to the question of watering, which is by far the most important operation in the cultivation of plants. A plant may be put in unsuitable soil, or the potting may not be well done, yet it may struggle on better than circumstances would lead us to expect if it is properly managed as to water. Not so if the watering is unskilfully or negligently done. It is difficult to treat on this subject in any but general terms, inasmuch as, in many cases, each species and variety of plant requires a difference in the degree of dryness to which the soil should be allowed to get before applying water, which can only be learnt by practice and close observation, assisted by a geographical knowledge of the countries where each individual species is indigenous—knowledge which consequently gives some clue to the conditions it exists under, especially as to moisture. But this, as will be seen, can only apply to natural species; with the great numbers of garden hybrids of hard-wooded plants that exist there is no guide excepting practical experience. Take, for instance, numbers of Heaths: Erica Cavendishiana, if kept as dry at the roots as any of the aristata hybrids absolutely require to be, would die the first summer; and the same difference as to their requirements exists in numbers of other plants equally nearly allied.

As a rule the slower a plant naturally grows, and the finer its roots are, the less water it requires. When any plant is in active growth it is necessary to keep the soil more moist than when it is at comparative rest, and also when the roots have full hold of the soil much more water may be given than would be advisable for some time after potting. When a plant is watered, see that it receives enough to run through the bottom of the pot; but in the case of plants that have been recently potted, only give sufficient to just appear through the bottom. Never water a plant in the middle of the day in hot weather when the sun is on it—many deaths are caused by this. When it happens to be necessary to give water under such conditions, the plant should be shaded for an hour or two afterwards. For greenhouse plants use water of the same temperature as the house they are grown in.

Always use rain-water where it can be

obtained; otherwise, the softest river or spring water that can be procured. In all cases let it be exposed for some time to the air, and not used, as is sometimes done, out of close tanks, where there is an accumulation of foul gases. There are few hard-wooded plants, when in full growth, that do not like weak liquid manure in a thoroughly clear, transparent state; but always be careful to err on the right side by applying it weak enough. It is immaterial from what it is made. We have used that from the stable and the cowshed with equally good results.

Soil.—In the successful culture of plants in general, but more especially of those that have their roots confined in the limited space of a pot or box, a great deal depends upon the use made of suitable soils. We cannot always copy Nature so closely as to give to every plant a soil exactly similar to what it enjoys where found indigenous, but in most cases, by a judicious selection, we can come sufficiently near for all practical purposes. With few exceptions, slow-growing hard-wooded plants with fine roots require peat, or a mixture of peat and loam, for their successful culture. And we may here observe that there is a great difference in the quality of the peat found in different parts of the country—a difference very much greater than mere appearance would lead us to suppose. In the northern counties it is mostly of a hard close nature on the one hand, or too soft and spongy on the other, all being deficient in fibre. Light peat will be found where the common brake grows in thick beds, the fine roots of which are the fibre required; the strong rhizomes ought to be carefully picked out previous to use, as they sometimes produce fungus. Stronger peat for plants that require it should be got where rough benty grass grows thickly. The grass should be pared off as thinly as possible, and about four inches thick of the under sod should be used; this will generally be found to be darker coloured and much heavier than the preceding, and is well adapted for most Heaths; while, for such plants as require a somewhat lighter soil, it can be mixed with the first-named in equal proportions. When mixed with the proper quantities of sand, according to the requirements of the several varieties of plants, these two sorts of peat, after lying in a heap for six months, will be found all that can be desired.

In respect to loam, that of a yellow or brown colour will be found best; it should be obtained from good dry pasture land, the older the better, and that which produces the best and finest varieties of grass will be the most fibrous. This should not have the sward pared off, but should be got about two or three inches thick, and allowed to lay in a heap for twelve months previous to being used.

For all plants of value use silver-sand, such as is generally to be met with on commons where peat is found. In most cases it requires washing, to remove all the fine dusty particles, as the sharper it is the better. The objection to pit sand, when it is at all of a brown or red colour, is that it is generally impregnated with iron. Where good silver-sand cannot be had, clean river sand may be used, but it is necessary to be careful to obtain it from a stream where there are no chemical or manufacturing works carried on, otherwise the impurities from these will render it unfit for plants.

Potting.—For the commonest plant see that the pot is thoroughly clean, otherwise the next time the plant requires potting a considerable quantity of the roots will adhere, and the plant be consequently injured. In all cases see that there is a sufficient amount of drainage used. For pots from 18 to 24 inches in diameter, 3 inches of crocks will not be too much, smaller pots in proportion; and to prevent the soil getting down and choking the drainage, carefully place a layer of the largest pieces of the soil used in potting over the crocks. As a rule the hardest-wooded, slowest-growing plants require the most sand in the soil.

In preparing soil for potting never sift it, except for newly stuck cuttings: sifted soil has always a tendency to become too solid, and plants that are potted in their early stages in soil so prepared are liable to get dry in the centre of the ball. Let the soil be broken carefully with the hand in pieces varying from the size of an acorn to that of a hen's egg, according to the size of the plant to be operated upon, using the finest soil for the smallest plants.

Never pot with soil that is either too wet, or too dry; the first will rot the roots with which it comes in contact and will become sour; the latter will seldom take water properly. One or two days previous to potting any plant see that the ball is properly moistened all through, but always allow sufficient time for the water to drain off, otherwise it will sodden the new soil—the object being to allow the longest possible time between the operation of potting, and the time when the plant requires water afterwards. Even with the greatest care in removing a plant from one pot to another some roots are certain to get injured, and applying water to them before they have time to heal up is the most likely means for their destruction. Indeed, we have no hesitation in saying that there are more newly-potted plants killed from this cause than from all others put together. All hard-wooded plants should be potted firmly, and at each succeeding potting, through the whole course of their existence, see that the new soil is made quite as solid as the ball of the plant, otherwise the water will find its way down the sides of the pot, and death, or an unhealthy condition, will soon follow. In potting always use a lath to ram the new soil down, so as to insure its being made thoroughly solid. and finish off by leaving the soil for half an inch round the side of the pot a little higher than the inside of the ball, which prevents the water from settling too much through the new soil.

Never fill the pot too full of soil, as this makes watering a tedious operation. In the case of plants in from 18 to 25-inch pots, 1¼ inches or 1¾ inches is not too much depth to leave—smaller plants in proportion. In potting always keep the collar of the plant well up. In shifting large specimen plants use two strips of strong canvas, 6 inches wide and 2 yards long. These put under the ball of the plant, after it is removed from the old pot, by which means two men can with the greatest ease lift the plant into the new pot, without injuring the roots or breaking the ball, as too often is done in getting the plant into the new pot. The canvas can easily be removed, one piece at a time, by tilting the pot over on one side. After potting, always place the plants where they can be kept a little closer—that is, where they will receive less air—for a few weeks, and shade carefully from the sun. Keep the surface they stand on, and the sides of the pot, syringed several times a day, if the weather is hot. After from two to four weeks of such treatment, gradually inure them to the sun and full air.

TYING.—It should be borne in mind, in dealing with this subject, that the majority of greenhouse plants are naturally of a formal habit; others in a state of nature are weak growers, half procumbent, and under artificial cultivation are certain to be somewhat weaker—consequently they must have sufficient support to keep them in something approaching the shape they would assume naturally. Plants that have to be conveyed to exhibitions must have their shoots properly secured, to prevent their chafing, else there is no possibility of moving them without their flowers being disfigured. Plants for home decoration require only sufficient support to keep them in something like their natural shape.

In tying a plant never use more sticks than are absolutely necessary to steady it, and display the flowers to the best advantage. Where it can be done, keep some of the shoots higher than the rest, and this will tend to break the objectionable even surface that the plants otherwise have. One of the greatest evils in tying, so far as the health of the plant goes, is the practice of forcing the sticks too far down amongst the roots. For weak-growing plants, like many of the Heaths, Aphelexis, and Dracophyllum gracile, the sticks ought never to enter the soil deeper than 3 inches; in the case of plants with heavy branches that require a few strong sticks, these may be put deeper, and will not do much harm if not used in too great numbers.

In tying a plant of any kind, some consideration should be given to its natural habit. If a low spreading bush, it merely requires sufficient support to keep its branches in their natural position. If it is an upright grower, assuming more or less of the pyramidal form, then it is necessary in the early stages of its existence to guard against its ultimately becoming naked at the bottom, by training the strongest branches in a horizontal position from the collar, or as near down to it as they can be got to the sides of the pot. The points of the shoots will naturally turn up of their own accord; and any that are over-strong may have their points pinched out. The reason for keeping the strongest branches low will be obvious. If they are allowed to remain in their upright position, bringing only the weaker shoots to the outside of the plant, the strong branches run away with all the strength and starve the weaker ones, which ultimately die. The plant is thus left naked, and, in the case of very many greenhouse plants, worthless, as the greater number of these will not bear heading down sufficiently low to refurnish the base. But in training plants of this naturally somewhat upright habit of growth they should not be kept so low as to destroy the natural habit of the plant, but be allowed to grow so that their height will considerably exceed their diameter. Never overcrowd the branches, especially whilst young, and in all cases keep them only close enough to furnish the plant sufficiently. In tying any plant care should always be taken that the material is not drawn too tight, or the branches will be injured. This is so evident that it would appear unnecessary to mention it; yet from the frequent injury done in this way it becomes necessary to point it out.

Propagating.—The cuttings of greenhouse plants can be struck without the aid of bottom heat, provided that the temperature of the structure available can be kept at the required heat; but there are some plants that root more readily with the aid of bottom heat.

STOVE PLANTS.

General Remarks.

Among the immense number of plants cultivated under glass at the present day, many of the stove species stand unrivalled for the profusion of their gorgeous flowers, and long-continued habit of blooming; they are alike unequalled for the decoration of heated glass structures as for affording a continuous supply of flowers for cutting. The hot as well as the somewhat cooler regions of the Eastern hemisphere, South America, and adjacent islands, have furnished us with a wealth of plants producing flowers, of almost every form and hue, wherewith to decorate the warm stove and intermediate house. In addition to these the majority of the most beautiful fine-leaved plants we possess come from warm countries. Along with the properties already mentioned, most stove plants possess the merit of being much easier to grow than the generality of greenhouse subjects as to their requirements in both soil and water. Many kinds of stove plants, although they may do somewhat better in peat, can be grown in turfy loam; and in respect to water they are not nearly so impatient as are greenhouse plants of receiving a little more than they require, or having it given them before they need it. For these reasons, many succeed in the cultivation of stove plants who fail with the more difficult to manage hard-wooded habitants of the greenhouse. Another thing in their favour is that, when the strong growing, large kinds have reached a size that would require more room than it may be deemed desirable to give them, the heads of the plants may be freely cut back, and the roots correspondingly reduced, shaking a great portion of the old soil away and replacing it with new. This may, even with many hard-wooded sorts, be repeated as often as found necessary, and thus the need for such very large pots as would otherwise be requisite is done away with.

All plants that require a temperature continuously higher than the occupants of a greenhouse, come under the denomination of stove plants. Yet, indigenous as they are to many different parts of the world—some intensely hot, others more temperate, consequent upon latitude or more or less elevated position—they evidently under cultivation require a considerable difference in the temperature they are grown in. Hence, where an extensive collection exists, it is better to have at command the means to keep such as require it warmer than others that will do with less heat and succeed in a temperature of an intermediate character betwixt the hot stove and the greenhouse. Where some arrangement of this sort is not available, there must necessarily be a compromise in the treatment they receive, some being kept hotter than they need, whilst others are too cool. But a good deal may be effected by placing those that want the most heat at the warmest end of the house, next the boiler, and putting such as require less heat at the coolest end. In a house of say thirty-five or forty feet long, there will usually be a difference in temperature of half a dozen degrees between the hottest and the coolest end. To still further meet the wants of the plants in this matter, the greater portion of the air given can be admitted at the coolest end of the house.

Position, Form, and Construction of House.—In the cultivation of flowering stove plants, one of the most essential matters is a house so constructed and situated as to afford the greatest possible amount of light. Without this it is vain to expect anything above mediocrity in the results. This will be seen when it is considered how comparatively limited is the amount of cold external air that can be given, especially during the early part of the growing season, consequent upon its causing too great a reduction in the temperature, but still more by its producing too dry a condition of the atmosphere consistent with the absolute requirements of the plants. Their growth, as is well understood by all who have had even limited experience in the cultivation of stove subjects, is very rapid. From this and the preceding cause, unless they are grown in a house that will afford them a maximum of light, the wood and leaves are so soft and deficient in substance as to render them incapable of producing flowers in their wonted quantity, size, or colour, light being the great compensating element that in a measure makes up for the limited quantity of air which plant life under such conditions necessarily receives. Hence, the stove should be constructed so as to afford an abundance of light, and so placed as to be in no way under the influence of buildings, trees, or walls that will either obstruct or absorb it.

This is a matter of vital importance, which cannot be too forcibly impressed upon all who essay the cultivation of these plants. With this view, the stove should always, where practicable, be span-roofed. In a lean-to, hip-roofed, or even half-span, the back wall always absorbs so much light as to seriously interfere with the short-jointed, robust growth essential to success. The dimensions of the stove will of course be determined by individual requirements. A very useful size for the class of plants under notice is 18 feet in width, by 45 or 50 feet in length; if narrower than this, it does not admit of the best and most economical arrangement, and if wider, it necessitates the elevation being greater than consistent with an easy maintenance of the required temperature in severe weather. The depth of brick-work of the sides and ends should be similar to that advised for greenhouses, but there should be movable shutters for the admission of air in the side-walls. The upright side-lights ought to be fixed, as the opening of them entails the admission of air in direct contact with the plants, than which nothing can be more objectionable or more calculated to check the young tender growth. There should be provision for sufficient roof ventilation, opening in the same way as the greenhouse. In the matter of internal arrangement the side stages should be similar in width, material and construction, the paths the same; but in place of a centre stage there should be a brick-built pit, 3 feet in depth, to be kept filled with tan. In a house of the above width and elevation, for the hottest section of plants, there should be five rows, three flows and two returns, of 4 inch pipes running round the house under the side stages; these will not be too many. We do not advise any piping under the tan-bed, being convinced that there is nothing gained by it. For the cooler stove, or intermediate house, three rows similarly placed will be enough. If the side stages are made of open bars of wood-work, the excessive heat arising from the close proximity to the pipes will affect the plants. The distance these stages are from the glass adapts them as stands for not only the smallest plants, but for moderate-sized specimens. The largest-growing subjects will, of course, occupy the centre of the house in such an arrangement as that under consideration. In some cases, to make the most of the space, a shelf may be hung from the roof over each path; but with these there is this inseparable disadvantage, that the light is intercepted from the other plants to a serious extent; consequently this counterbalances the gain, and the shelves are better absent. Of course, such an arrangement as this implies that the whole of the plants are grown in pots or tubs.

At the present day the planting out of stove plants in preference to pot culture is sometimes advised. This may do where a considerable portion of a house is devoted to the cultivation of some particular species or variety, as with those who grow certain things in quantity for market; but, even where such is the case, it does away with the possibility of removing any portion for retarding or accelerating the blooming as may be found desirable. The system has also another and serious disadvantage, that it prevents the plants being moved, to be dipped or washed by syringing, for the destruction of insects. Neither is there anything gained by planting out in this way, as the plants, if well-managed, can be grown quite as well and as quickly in pots. In a house of large dimensions planting out may be resorted to with good effect, so far as appearance goes; but the inevitable consequences are that a few of the strongest growers overhang and seriously injure the others, and when any plant is out-growing its neighbours there is no means of remedying the evil without taking up and replanting, which in many cases, when the specimens have become large, means nothing less than their destruction. The position which the gardeners of this kingdom hold, so far in advance of those of any other country in the cultivation of plants, is due to the great superiority they have attained in the individual culture of each and all of the immense number of species and varieties that they grow, and not to the appearance produced by a crowded arrangement for mere effect, whereby the health and general character of nine-tenths of the things grown are completely destroyed. In large structures an arrangement equal in appearance to planting out may easily be effected by growing the plants in pots or tubs, and plunging them in a bed prepared for the purpose. In this way they have the look of being planted out, with none of the objectionable consequences following from that system; there is also the great advantage attached to the plunging, that the whole arrangement of the house can at any time be altered by a different distribution of the occupants, and thus the monotony of one position is done away with.

Where anything of this nature is carried out, it of course implies that the use of stages or centre pits is altogether dispensed with.

Temperature and Light.—The temperature that stove plants will bear and require if they are to be made the most of by giving them as long a season for growth and flowering as is consistent with their health and wellbeing, is a subject upon which very different views are held. The injunction not to raise the temperature of the stove until the days get long, and to keep a low night temperature, has been repeated until it has well-nigh become an article of faith in gardening practice, and the suggestion of anything opposed to this is frequently looked upon as an innovation, the adoption of which would quickly exhaust the plants. Yet those who hold such views very likely have never given a thought as to the night temperature that many of our stove plants are subject to in their native countries, even during the coolest season, neither have they considered the short season of rest they there undergo. On this latter point some allowance must be made for the shorter days we have in this part of the world in winter; yet we are thoroughly convinced by repeated trials extending over a long period of time that the reason so many fail, or only partially succeed, with many of the best stove plants, is on account of the much too low temperature those plants are kept in during the winter, still further aggravated by their being kept dormant for much too long a period. The teaching that stove plants should not be excited into growth until the sun has got much power is so plausible, that many take it for granted and act accordingly, without ever attempting to prove it one way or the other by practice. It must be borne in mind that we are not now speaking of plants that only require, and which do the best in, an intermediate temperature, but of plants from the hottest parts of the world; and of these we say that by far the greater number are rested too long in the winter, and during that time kept in too low a temperature. But when plants are started early, whilst the days are short, they must be grown in thoroughly good light houses, with the larger specimens that occupy the centre of the house elevated so as to all but touch the roof-glass.

The all-importance of light, in the fullest measure we can give it, for flowering plants that are subject to a high temperature, has not yet been fully realised by all growers, possibly through the necessity for shading many plants from the direct rays of the sun when it is powerful. But we must not forget that it is a very different thing to simply shade a plant from the burning influence of the sun and to place it continuously where it will not receive sufficient light—a condition inseparable from plants when they are plunged in bottom heat in most stoves, and as usual in this way much too far from the glass, or when stood, as too frequently seen during the growing season, in a position where effective arrangement was more considered than their wellbeing. The same effects are inevitable when too many roof climbers are grown over the general occupants of the house. Where the plants are of necessity subject to any of the above adverse conditions as to the solidifying, life-giving element, light, then of course it is better not to excite them too early by subjecting them to a temperature that will force them into rapid growth before the days get a good length. To the fact of flowering stove plants being able to exist in some sort of condition when they do not receive the full volume of light they so much need, may be attributed the apparent too general forgetfulness of their wants in this matter. For hot stove plants 65° in the night and 70° in the day, during the shortest days of winter, is the temperature that will be found most suitable to their requirements; and four or five weeks at the end of the year with four or five at the commencement is quite as long as it is either necessary or advisable to keep them at this. As soon as we get fairly into February the heat may be increased two or three degrees, and raised higher as the days lengthen. During the time of the lowest temperature all deciduous plants, or such as are nearly so, should have the soil kept very dry, but not in a condition absolutely devoid of moisture, or such as would cause the bark to shrivel. This completes the thorough ripening process they need, and induces the cessation from growth also requisite. Plants so managed have their buds up plump and strong, ready to burst into strong sturdy growth as soon as water is freely given; whereas those that are forced to rest by being chilled in an unnaturally low temperature are in a condition neither of wood nor roots to start freely. With many plants that are so rested it turns out to be their last rest, the life being starved out of them. The dry condition of the soil during the dormant season so necessary for deciduous kinds, or such as cast the greater portion of their leaves like Allamandas, and Bougainvilleas, must not be attempted with such as are evergreen, for instance, Ixoras and Gardenias. These are very often injured by not receiving enough water at the root in the dormant season, as also by keeping the atmosphere much too dry. The conclusions we have arrived at on this subject are not based upon mere conjecture, but on experience. Numbers of the best and finest stove plants we ever grew were subject for nearly a score of years to a temperature through the winter of never less, except on the occasion of very severe frost, than 65°. Some things were never during that time quite at rest, simply alternating between active growth in the summer and slower growth in the winter. Yet the treatment they were thus long subjected to did not produce the slightest symptoms of wearing out; on the contrary, the oldest plants were as strong and vigorous as they were the first season they were grown. Ixora coccinea (the king of stove plants) we have cut freely back the first week in September, and have had the same plant in the middle of May bearing a hundred heads of flower, over a score of which were from 6½ in. to 7 in. in diameter, measured through the centre of the flowers. Many of the shoots springing from the collar of the plant, and formed within this time, were over five feet in length, proportionately strong, with leaves almost as big as a common Laurel. Such growth as this was not produced by starving the plants through the winter in a low temperature, but the opposite; they were never plunged in bottom heat, but kept elevated within a few inches of the glass in a good house (where they got every ray of light possible), and lowered gradually as the shoots extended.

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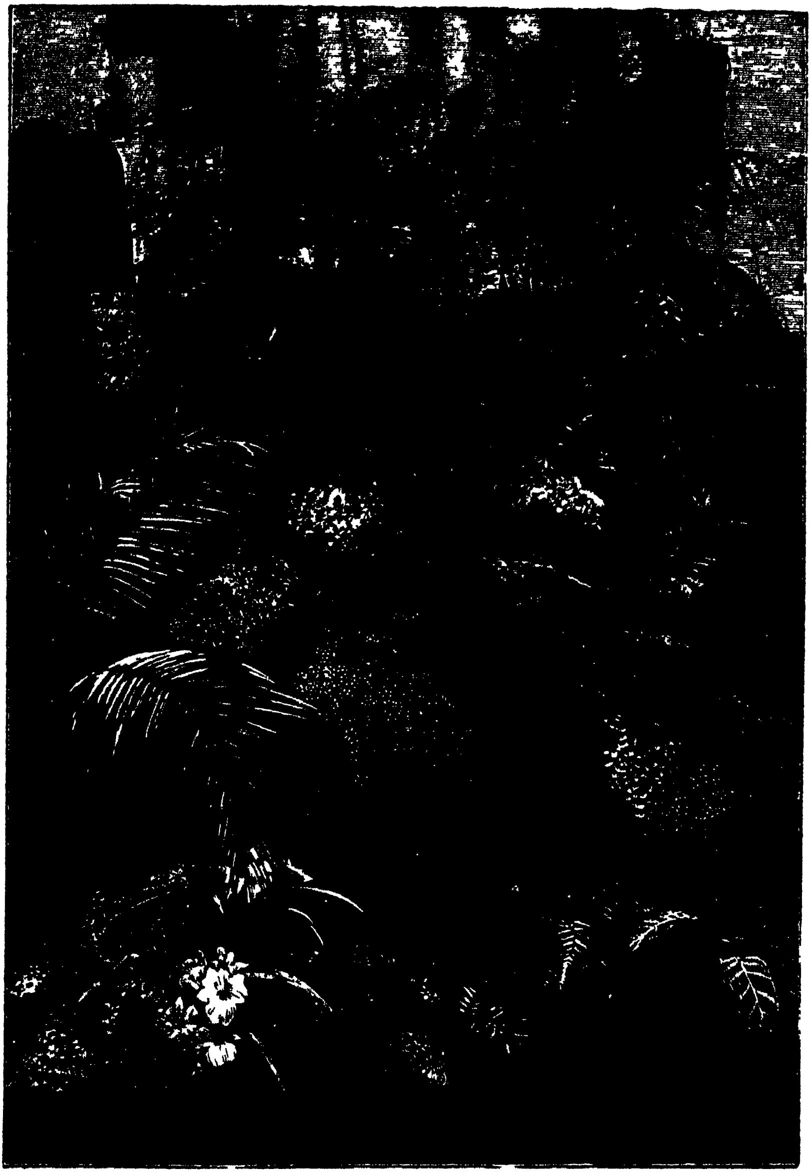
WATER.—Most stove plants, consequent upon their rapid growth, need, when in an active state, a large quantity of water; some require to have the soil always kept comparatively moist; others, when at rest, want drying off, and should receive, for a considerable time, very little. At no season of the year ought water to be given in a cooler state than the temperature the plants require to be grown in; and all through the growing season it may, with very great advantage, be applied warmer than the temperature of the house they occupy.

SOIL.—The soil required for growing stove plants should always, whether peat or loam, be of a good description, containing plenty of fibre. This is necessary, as the amount of water requisite for the greater portion is such that decomposition of the vegetable matter contained in the soil is very rapid; this also necessitates the presence of sand amongst the soil in sufficient quantities to insure porosity. In potting stove plants there is one essential that should never be lost sight of; it is that the soil, before using, ought always to be placed where it will become as warm as the temperature of the house in which the plants to be operated upon are grown. When the soil is used in a cold state it necessarily chills them, at a time when they are least able to bear it, when their roots have been more or less broken in the operation of potting.

TYING.—The extent to which stove plants require to be trained and tied depends on the uses they are to be put to. For ordinary decorative purposes no more supports need be given than are requisite to keep them in shape, and to avoid an untidy straggling appearance. When they are to be used for exhibition the branches must be sufficiently secured to prevent friction during removal, or they are sure to suffer and to be rendered unsightly.

PROPAGATION.—In respect to the propagation of stove plants from shoot cuttings it may be well to remark that, as in the case of plants that do not require so high a temperature for their cultivation, there is much difference in the readiness with which some kinds strike in this way as compared with others. Much the greater number root readily from cuttings made of the soft or half-ripened shoots, severed at a joint in the usual manner; but in the case of all plants the cuttings of which are advised to be taken off with a heel (that is, with the small portion of more solid wood attached which forms the base of the shoot at its junction with the stem from which it has sprung), it may be taken that they are more difficult to strike, and do not root freely from ordinary cuttings. Plants that in this way give some difficulty in their propagation can also, almost always, be struck from root cuttings, where the roots are at all of a fleshy character, and not naturally of a thin, hard, wiry description. Small pieces of such roots, cut into lengths an inch or so long, and treated in the usual way as to the heat and moisture, rarely fail to grow. In striking cuttings of some stove plants, bottom heat is an assistance,—that is, the means of plunging the pots or pans wherein the cuttings are to be inserted in a medium that does not fluctuate between day and night like the temperature of the house. This is an advantage, particularly with cuttings of such plants as are slow in forming roots. But, nevertheless, where the temperature of the house or pit at command is moderately steady and can be kept high enough, cuttings of most kinds can be rooted as well by con-



ROCKPOOL IN FERNERY AT GREENFIELD. *To face page* 10

fining them under propagating glasses, or in an enclosed case within the house or pit.

INSECTS.—We would particularly direct the attention of all beginners who aspire to grow even the most common plant well, to the necessity of waging a continuous war against the different insects that prey upon plants, especially those under artificial cultivation. Plants here exist under conditions the least favourable to their withstanding the ravages of insects, inasmuch as the limited extent of the food supplied to them in the confined space allotted to their roots must render them less able to bear the extraction of their life's blood—the sap—which these animal parasites are continually draining from them, than they would be if cultivated in the open air, with full scope for their roots to extend in all directions in search of food. Still more, insects that prey upon plants in glass structures exist under conditions most favourable for their development; here their breeding season is in most cases prolonged to the whole of the year, and they are secure from their natural enemies, which in a state of nature would often make short work of them. We have observed that any plant which in the early stage of its growth is seriously injured through the ravages of insects, is never, even if afterwards thoroughly cleansed and well nursed through the remainder of its existence, extending over a number of years, so vigorous or so capable of being grown into a fine specimen as a plant that has not similarly suffered. It always appeared to be affected like a plant that has been stunted through insufficient root-room whilst young. By this it will be understood that we are alluding to the more injurious species of insects that affect plants. There are two especially—white scale and mealy bug. Where these exist to any extent in a collection of plants, it is an impossibility ever to have them in such condition as where these insects are absent; brush, sponge, and syringe may be kept incessantly at work, but unless means be taken for their thorough extermination the continual use of these appliances leaves its mark in the shape of scanty injured foliage and meagre flowers. Brown scale, thrips, aphides, and red spider, to a greater or less extent, are ever troublesome on plants cultivated under glass, and their presence to any considerable extent is highly injurious. Where a high standard of culture is aimed at they must be kept well under. The means that can be had recourse to for the destruction of each is often different in different kinds of plants, inasmuch as all are not alike able to bear an application of the same means for killing the insects. Consequently, we have found it advisable to give together with the directions for the cultivation of each genus of plants the means we have found best calculated for the destruction of the insects to which it is subject. The above remarks, applying to stove plants, and those of a like character which will be found relating similarly to greenhouse plants, as a matter of course will be understood as being of a general character in their application. Great numbers of species and varieties of plants require something or other exceptional in their treatment as compared with that of others; particulars in every case will be found given under the head of each particular kind.

There are several operations connected with the cultivation of plants of nearly all kinds that are so general in their application—such, for instance, as always having the pots clean inside as well as outside, before putting any plants in them, and of draining the pots properly—that it has not been considered necessary to allude to them in the directions given for each particular species or variety of plant, except where it is needful to be more than ordinarily careful. This, of course, applies to the greenhouse and stove plants, flowering as well as fine-leaved. In the plants hereafter treated of, the particular purpose that each species and variety is adapted for is pointed out, whether as roof climbers, trained pot specimens, large or small, for yielding flowers for cutting, or for general decorative use.

FERNS.

GENERAL DETAILS OF CULTIVATION.—It is needless to say that Ferns are indispensable in any collection of plants, however select. Their elegant, distinct, and varied forms afford a marked contrast to everything else in the vegetable kingdom, varying in appearance as they do from the noble arborescent species to the low spreading Hymenophyllums, with their singular filmy leaves, and the grotesque-looking Platyceriums. They are favourites with all lovers of plants. With few exceptions, they are easily grown, providing a few matters indispensable to nearly all the species are kept in view. Taken as a whole, Ferns are moisture and shade-loving plants, mostly found growing naturally in damp places, where there is not only a considerable amount of moisture within reach of their roots, but where the atmosphere is more or less charged with moisture.

The usual method of propagation is from spores—the name applied to the seeds of Ferns. These are very small, and if care is not taken they are liable to get washed down so deep in the soil as to prevent their vegetating. Broad shallow pans are the most suitable for sowing in, and these should be well drained and filled with a mixture of sifted fibrous peat, with some broken sandstone or crocks added, and enough sand to make the whole porous. Press the material moderately firm in the pans, and give it a good watering to get the surface quite smooth; on this sow the spores, not too thickly. Stand the pans in larger ones that will hold water, and in these keep a small quantity, about an inch or so in depth. This water the material the spores are sown in will draw up so as not to require the giving of any directly on the surface; in this way the danger before indicated of the spores being washed down too deep is avoided. Stand in a temperature of from 50° to 65°, according to the time of the year, and the more or less heat the species requires. It is well to sow the spores as soon as they are in condition, which, in the case of many, will be towards the latter end of summer. Some kinds vegetate more quickly than others, but in the case of the spores of most kinds sown at the time indicated, they will begin to grow during the autumn and winter. They should be kept through the interim at about the heat already named; as the weather gets warmer in spring raise the temperature proportionately. As soon as the plants are large enough to handle they may be pricked off from three to half a dozen together, according to the size of the different species, in three inch pots, filled with soil similar to that in which they were sown. An intermediate heat, with shade, plenty of light, air in the day time, and a somewhat moist atmosphere, with abundance of water to the soil, are what they require. Some kinds may need moving to single pots before autumn, whilst others that make slower progress will do better undisturbed until about February. This is the best time to pot most kinds of Ferns, as they never like their roots disturbed much, least of all after they have begun to make growth. After potting, treat in general as advised for the preceding spring and summer. Once a year is often enough to pot Ferns of any kind, and all that will be necessary subsequently is to give more room each spring as required, using the soil in a lumpy state as the plants get larger, with about one-sixth of broken crocks, charcoal, or coal cinders amongst it; any of these will answer to keep the soil porous, which is essential. Where large specimens are required of the creeping stemmed species—such as the Davallias and Gleichenias—wide pans or pots must be used, but it is a mistake to give Ferns pots as large as many plants require. Even the tree species, when large, can be kept in a healthy, thriving condition, with half the root-room that is frequently given, and excessive room results in the fronds outgrowing reasonable space. With the aid of manure-water during the growing season, Ferns of nearly all kinds can be kept in the best condition in smaller pots than most things. Most Ferns when they have arrived at a size such as deemed sufficiently large, may be kept in a healthy condition for two or three years, without repotting, by the aid of manure-water in the growing season. One matter of importance that applies to Ferns generally, is that they should never, even in the winter, be allowed to get so dry at the roots as many other plants.

The creeping stemmed species can be propagated by division of the rhizomes, which in all cases should have some roots attached; the division ought always to be effected early in the season before growth has commenced. Others, with habit of growth like the Adiantums, will bear division; the crowns should be separated with roots attached to each.

Most of the species of stove Ferns in cultivation do better when grown with less warmth than they are often subjected to. When more heat is used than they require, the fronds are weaker, and do not remain in a fresh, healthy condition so long; they are likewise more susceptible to the attacks of insects, and are much less useful for cutting. For most of the stove kinds a night temperature of 50° to 55° during the autumn and winter, with a little more in the day, and 60° by night, with a rise proportionate to the weather in the day, in summer will answer. The Gymnogrammas, and a few others, are an exception to the generality of Ferns that require more than cool greenhouse treatment, as they must be kept warmer; 60° in the night in winter is better for them than a lower temperature, and they should be given proportionately more in the summer. Such kinds as come under the denomination of greenhouse species have a better appearance when kept slightly warmer in the winter than the coolest section of general greenhouse plants, say about 45° by night. And in the case of this division the plants should never be subjected to dry currents of air, or in fact have sufficient air given them to dry the atmosphere so much as needful with ordinary greenhouse stock. At the same time more moisture should be used in the atmosphere than in the case of other greenhouse plants. Plenty of light is of great importance, especially through the growing season ; shading from the sun when it is powerful most of the species require, but by far the greater number of Ferns like more light than is usually given them.

As will be seen, there is no difference between the stove and the greenhouse kinds in the matters of propagation, potting, soil, &c.

INSECTS.—Most of the insects that prey upon plants grown under glass affect Ferns. Thrips, in particular, are troublesome, and are best destroyed by syringing and fumigating, and by dipping and washing with tobacco water when the growth is matured. Greenfly sometimes affects the young fronds, and as a remedy fumigate slightly. Scale is the worst to contend with on these plants, as where it gets a lodgment on many of the species, such as the Gleichenias, it is difficult to deal with when the specimens are large. Repeated washings with insecticide when the plants are at rest, is the best remedy. For mealy bug syringe freely with tepid water.

PALMS.

GENERAL DETAILS OF CULTURE.—Until within comparatively recent times these elegant plants were rarely seen except in Botanic gardens, the general supposition being that they were too large for cultivation in private places. But better acquaintance with them proves that there are many which possess naturally a sufficiently dwarf habit to admit of their being grown for a number of years in pots or similar appliances, by which their growth may be still further restricted, so as to keep them within sufficient bounds to admit of their being accommodated in houses of ordinary size. Many of the species will bear this dwarfing treatment and yet exhibit their elegant form and character in such a way as to render them beautiful objects for the decoration of rooms and other places where only plants of small size would be admissible. So accommodating are Palms in this respect, that many which naturally attain a large size can be kept quite small whilst still having a healthy appearance. Another peculiarity possessed by these plants, which goes far to commend them, is that many of the species will grow in a considerably lower temperature than that in which they exist where found indigenous.

The family of Palms is a large one, containing many genera and a great number of species, comparatively few of which, however, are suitable for the general cultivator, and it will be better to confine the accompanying details to such as grow freely. Those kinds that produce suckers can be increased by division, potting the the suckers when taken off singly, and keeping them warm and in a little closer atmosphere until they get established. But the general method of raising these plants is from seeds, which are imported from the countries where they grow naturally. The seeds ought to be fresh, and, supposing them to be started about the beginning of the year, they should be sown moderately thickly in shallow pans, drained and filled with ordinary loam sifted and mixed with enough sand to make it moderately free and porous. A little fine soil should be put over the seeds and they must be placed in a temperature of about 70°. There is considerable difference in the time the different species take to germinate, some being much quicker in this than others. When the young plants have made a little growth they must be put singly into small pots before their roots get entangled ; if allowed to stop too long in seed-pans they suffer in this way. The seedlings will bear a strong heat in the summer—65° or 70° in the night ; the higher figure is not absolutely necessary, but under it they make more progress. They will do with 10° or 15° higher than this in the day time. They should have a fair amount of light to keep them from drawing up weakly, and have air in the day ; shade when the weather is bright, and give plenty of water, without which at all times most kinds will not succeed well, and will become of a sickly yellow colour. Some of the freest growers will want a little larger pots towards the end of summer ; in this the cultivator must be guided by the amount of roots they have made, as it will not do to let them get pot-bound at this stage. Palms will succeed in either peat or loam. We prefer the latter where it can be had of a good mellow nature ; it should have a moderate quantity of sand added. Discontinue shading as the autumn advances, and reduce the temperature day and night ; 60° in the night through the winter will answer for all the heat-requiring kinds, with a rise of a few degrees in the day more or less according to the weather. About the end of February all that were not potted a second time will most likely require moving into larger pots in size proportionate to that of the particular species and the progress it has made; such as are 4 inches to 6 inches in diameter will most likely be found large enough. Soil a little heavier than that in which they were started should be used, the drainage made secure and the soil pressed firm. Increase the heat as the days lengthen, give air and shade as required, with plenty of water to the roots, and syringe freely overhead daily. Treat generally as advised for the preceding summer, and alike similarly through the winter; again give more root-room about February, shifting them into pots from 2 inches to 4 inches larger as the plants seem to require more or less room. Do not let the roots get cramped at this early stage, except in the case of such as are required for use in a miniature state.

For decorative purposes in a larger state, it will usually be found advisable to grow the different kinds on to a height of 3 feet or 4 feet with as little delay as possible; consequently, until that or something of a like size has been attained it will be well to treat them to as much root-room as will in this way assist free growth All that is required afterwards is to continue the treatment hitherto advised summer and winter, regulating the size of the pots according to the size the plants are desired to be grown to. Most of the smaller growing kinds can be kept in a healthy state for years in pots from 10 inches to 18 inches in diameter, but when so restricted they must have manure water once or twice a week through the growing season, or the leaves will most likely be deficient in that healthy green colour which adds so materially to their appearance. Many of the stove species will bear standing in a warm conservatory for a time during the summer season, and so used will be found very attractive, but they should be returned to warmer quarters as the weather gets cooler. Care ought always to be taken that they have enough shade in bright weather to prevent the leaves being disfigured, for, if scorched with the sun, it takes a considerable time to admit of their regaining their wonted appearance—only possible by reclothing with new leaves.

The species of Palms that will succeed all the year round with greenhouse treatment are comparatively limited in number. Their propagation is the same as advised for the stove kinds, except that it is not necessary to give them quite so much heat. It is well for the first two or three years to afford them an intermediate temperature, as by this means time is saved in getting them up to a useful size. Where there is a house at command sufficiently large to allow of any of the favourite large growing kinds attaining a great size, such as to show something approaching their true character, the best course is to plant them out in a bed of good loamy soil—drained and sufficiently large to sustain them. In a case of this kind, however, it is well to grow them on in pots for some years until they have attained a size which will admit of their roots being present in quantities sufficient to run freely in the bed. It is well to observe here that the sorts which require comparatively little heat are much the most useful to the ordinary cultivator.

INSECTS.—The hard texture of the leaves of Palms is such that insects do not thrive upon them to such an extent as on many plants; yet, thrips, scale, and mealy bug frequently trouble them. Fumigate for the destruction of the thrips; a free use of the syringe and sponging are the best means for removing bugs and scale.

ABUTILON.

These remarkably free-growing greenhouse plants are natives of South America. Their handsome drooping flowers are produced freely from the young shoots through the greater part of the growing season. They are at no time clothed with the profusion of inflorescence that characterises some things that open most of their flowers simultaneously, but this is amply compensated for by the continuity of their production, rendering them objects of interest for a good part of the year. Most of the greenhouse section are of a somewhat straggling yet vigorous habit, which makes them especially adapted for covering walls or the draping of pillars or rafters; in such situations their beautiful pendulous blooms are seen to advantage. Their miniature Vine-like foliage is very handsome, and in some of the newer varieties is beautifully variegated, a good part of the surface being profusely marbled with yellow. They are plants of very easy culture, but the season of their flowering is much prolonged by their being grown where they receive through the winter and spring a few degrees more heat than the temperature of an ordinary greenhouse, such as usually kept up in a conservatory where plants in bloom are displayed through the dull season of the year; in a situation like this Abutilons keep growing and retain their leaves better. The flowers are well adapted for cutting, their natural drooping habit fitting them for associating with others of more upright form. The charming white variety, Boule de Neige, is one of the most lovely flowers grown, possessing the advantage of blooming in a very small state; plants of this sort, in 4 or 6 inch pots, flower from the axil of every leaf.

Abutilons are easily propagated in spring from cuttings of the young wood, if taken off when some 4 or 6 inches in length—if with a heel all the better; insert these in sand in small pots placed in a temperature of 60°, and covered with a bell-glass. Here they will soon make roots, and should then be moved into 6 inch pots. They will succeed in either peat or loam, but with these, as with most other free-growing plants, peat has a greater tendency to promote leaf-growth than loam has, and it is not well to encourage too much development in the foliage. This should rather be restricted, as foliage, when present in too great quantity, is prejudicial to free-flowering. Let the loam be of good quality, and mix with it enough sand to keep the whole in an open, healthy state; if, whilst they are in the younger stages of their growth, a little leaf-mould is added, it will assist them. As soon as they begin to grow, pinch out the points so as to induce them to break back. The free-rooting disposition of the plants will cause them to soon require more room; they must have larger pots before the roots become matted. By midsummer they will need moving. The stronger growers will bear a 4 inch shift, using the loam in lumps as large as pigeon's eggs; but at this potting add no leaf-mould, as they will flower more freely without it. Stop the points a second time, and keep them well syringed, both on the upper and under sides of the leaves, every afternoon; place them where they will be fully exposed to the light. They will require only a very slight shade for a few hours in the middle of the day in the hottest weather. After they have again broken into growth the shoots will flower as soon as they acquire strength sufficient. As the autumn approaches they will show signs of going to rest, and must not receive much water. During the winter keep them in a temperature of not lower than 45° in the night; by the beginning of March they should be kept a little warmer, and when growth has commenced they can be moved into larger pots—13 or 14 inches diameter will not be too much if large specimens are wanted.

When Abutilons are required to be grown as trained plants their natural disposition to spire up must be counteracted by regularly stopping and opening the shoots well out; so managed they make good decorative plants for the conservatory, and, as such, are very useful. After flowering they may be put anywhere where a temperature such as advised for the preceding winter can be maintained, and here allowed to remain until the spring. Then they should be cut close in, the heads reduced to within a foot or 15 inches of the pots, and, as soon as they have made a little growth, turned out of the pots; one-third of the soil should be removed and replaced with new, and the plants treated through the summer as before.

If the plants are required for the purpose of covering a wall, they may at once be placed where they are intended to be grown, and either planted out or kept in pots as deemed advisable for best attaining the object in view. If a large space has to be covered it will be better to plant out in a border prepared by, in the first place, sufficiently draining the bottom with a few inches of broken bricks, or something similar; over these place some suitable material, such as pieces of fibrous turf, on which put the soil, like in character to that advised for pot culture. Turn out the plants in this, making the soil firm round the ball, and at the same time training the branches so as best to effect the covering of the allotted space. Nothing further will be required than to attend to training and stopping, with a regular use of the syringe to keep in check spider, which they are subject to. A portion of the shoots will require shortening back at different lengths each spring, which will cause their breaking into fresh growth, so as to keep the whole space regularly furnished with young flowering wood; if this is not attended to, the bottom will get bare and destitute of both leaves and flowers. For clothing a pillar or rafter when the room to be occupied is somewhat limited, it is well to confine the roots to a pot, as, so managed, their naturally vigorous disposition is kept in bounds. For the purpose here under consideration the plants will not need stopping so early, but should be kept to a single stem until they have attained the height where they are wanted to branch out. For such uses as these they ought to be grown in not less than 15 inch pots; into these they may be transferred from 8 or 10 inch ones in the spring. The drainage must be ample, and well secured against the washing of the soil into it by the large quantities of water required through the summer. Keep them as they advance in growth well but not too closely trained in the places they are wanted to fill, and regulate the stopping according to the number of shoots requisite to furnish the pillar or rafter without being too much crowded. Where overcrowding occurs, the light elegant arrangement that should always exist in the training of plants in such positions is wanting, and the health and flowering capabilities of the subjects employed interfered with. Do not give too much water until the roots have got well hold of the soil; but when the pots are filled they will in the summer, when in full growth, need a copious supply, gradually reduced as winter approaches, when no more must be given than will just suffice to keep the soil a little moist. Before they begin growing in the spring, the strongest shoots should be cut back at different points, so as to induce the plants to break afresh regularly from bottom to top. When they have made some progress they ought to be liberally supplied with manure water: by this in a great measure they will require to be sustained, as the limited quantity of soil they occupy will become exhausted. Previous to growth commencing the third season they may be cut back freely and turned out of the pots, a portion of the old soil shaken away, the roots shortened, and replaced in the same pots with new material; further on in the season, if they show any signs of weakness, give manure water freely. Abutilons are gross feeders, and will bear it moderately strong. By the use of this and by periodically replacing the exhausted soil with new, the plants can be kept going for years in a healthy flowering condition, or they may be at any time replaced by young ones.

Abutilons can be raised from seed sown and subsequently treated as other warm greenhouse plants. but cutting propagation will usually be found best for the generality of growers.

Of late years immense numbers of new varieties have been raised; the following are a good selection of both old and newer kinds:—

A. Agatha. Orange yellow, striped with crimson.

A. Aurelia. Deep yellow.

A. Blandii. Dark yellow, veined and netted with crimson.

A. Boule de Neige. This is a beautiful plant, extremely free in flowering, producing its snow-white bells when in a small or large state; it is also very free in growth and adapted for a pot specimen, or for a rafter or pillar.

A. Cleopatra. Rosy pink, veined with crimson.

A. Duc de Malakoff. A free growing kind with very large highly-coloured flowers, handsomely marked. Suitable for a climber.

A. Eclipse. Bright orange, shaded with crimson, purple veins. A good compact habited sort.

A. lilaceum album. White, shaded with mauve; a dwarf habited sort, suitable for a pot specimen.

A. megapotamicum. A very free, handsome-flowered variety; will answer either as a pot specimen or as a roof climber; also known as *A vexillarium.*

A. Mons. Ed. Pynaert van Geert. Amaranth purple, veined with carmine, white throat.

A. Mons. Perpignan. Bright reddish orange, veined with crimson, dark yellow throat.

A. roseum album. Rose, veined with white, white throat.

A. Royal Scarlet. Brilliant scarlet. A dwarf habited variety.

A. Sellowianum variegatum. A very handsome kind, the leaves beautifully suffused with yellow and green.

A. striatum. A strong-growing bright-coloured kind, suitable for a wall, pillar, or rafter.

A. violaceum purpureum variegatum. Flowers purplish violet, the leaves handsomely variegated; very effective, especially when covering the back wall of a conservatory.

INSECTS.—Abutilons are plants not very much subject to Insects, although aphides and scale will live upon them. The former can be destroyed by fumigation or washing with tobacco or quassia water; scale, if it exist, must be removed with sponge and brush; red spider, to which they are liable, is best kept under by continuous use of the syringe during the growing season.

ACACIA.

The genus Acacia is represented by a very great number of species, from both Eastern and Western hemispheres. Some attain the proportions of moderate-sized trees, but most of them are evergreen greenhouse shrubs, indigenous to New Holland. Many possess great beauty, and hold a very conspicuous place amongst decorative flowering plants in our conservatories, where their elegant habit makes them very suitable for draping the walls and pillars, where, in the early spring, their profuse wreaths of yellow flowers are very effective. There are a few that are, more than others, especially adapted for use as pot plants, and can be so managed as to come into bloom at any time during the winter, through being brought forward in heat. Acacias are amongst the most easy of hard-wooded plants to grow, being of a most vigorous habit, not suffering seriously from a little inattention in withholding water, or from a little too much water at other times, which, in the case of many hard-wooded things subject to pot culture would be almost certain to cause death. Neither are they particular as to soil, as they will succeed in either peat or loam, but the latter is the most suitable, and in it their natural free disposition to flower is still further increased. They strike freely from cuttings, which may be put in at any time during the spring or summer, the former being preferable. If at the beginning of April the points of the shoots, about three inches in length, are put two or three inches apart in pans filled with sand, kept warm, moist, and covered with a propagating glass, they will root in six or eight weeks sufficiently to bear moving into 3-inch pots, for which loam, reduced to a fine state, with some sand and a little rotten manure, should be used. Pinch out the points and keep in an intermediate temperature to get them established, using a little shade when the sun is powerful, but letting them have plenty of light, with a moderate amount of air. Syringe overhead when the house is closed in the afternoons, with a liberal supply of water to the roots as soon as they have got well hold of the soil. By the end of July move into 5 or 6 inch pots, at the same time stopping the strongest shoots, and treating as before until the end of August. Then give more air, and cease shading and syringing, so as to get the growth solidified before the days become short; keep them through the winter at a greenhouse temperature, and about the end of March stop the shoots, and give 8-inch pots, now using soil a little more lumpy. Let the drainage be efficient, as Acacias are thirsty subjects; and provision must be made to ensure the large quantities of water they require passing freely off. Add sand in proportion to the nature of the loam, but let it contain enough to prevent any tendency to become adhesive. Ram the soil firmly into the pots; at once train out all the strongest branches in a horizontal position, bringing them well down, place in a light house, or pit, and do not give too much air for a few days, or allow them to suffer by going too long without water. As the sun gets more power syringe every bright afternoon, getting well under the leaves. As these plants are subject to red spider, they require attention in this matter all through the growing season, for although their leaves are not tender, or so soon injured as in the case of many things, still, when the spider has once been established upon them, they do not soon regain their fresh appearance. Give plenty of air through the summer, but no shade will be absolutely required; yet a little in the middle of the day in bright weather will do no harm if the plants happen to be grown with others that need it. When the roots have got fairly hold of the new soil the plants make rapid growth, and should be stopped as soon as they have made shoots about six inches in length, and any that are stronger than the rest be tied out so as to equalise the strength. At the beginning of August give plenty of air in the night as well as in the day, but continue the use of the syringe until September, after which there is not much to be feared from red spider. The plants will not now push much growth. Keep them as cool through the autumn and winter as can be done without danger of frost. If they are required, a portion may be had in flower by the middle of March. For this purpose they must some time before be placed in a temperature of 50° in the day time, and should be kept near the light. They ought not to be subjected to more heat than this, as it is quite sufficient to bring them into bloom, and it is not desirable to excite growth. When in flower they can be moved to the conservatory, where they will have a nice appearance for a month; if flowers are wanted, the strongest shoots can be cut and the remainder shortened back as soon as the flowering is over. The plants that have been let to come on of their own accord will succeed the others, and when they have bloomed may in like manner have all their shoots shortened back. The young growth will break in a few weeks, after which the whole, early and late flowered, may be potted. They will bear moving into 12 or 13 inch pots. This may appear a large shift, but their strong free-growing nature is such as to do with plenty of room, and it is better to get them on whilst young than to keep them back. Pot as before, and tie well out, being careful to furnish the base to the rims of the pots, and continue to bring down the strongest shoots; treat as in the preceding summer as to air, light, water at the roots, and continued syringing overhead. By the beginning of August those that were brought into flower early will have completed their growth (they will not require stopping this season, as they will now be sufficiently furnished with abundance of shoots, and will look all the better when in flower for having longer growth), and may be turned out of doors and exposed to the open air for six or eight weeks, according to the state of the weather. These will again come in for the first blooming, and may be started as before early in the incoming year. The later flowered plants, if it is desired to keep them back, should in the autumn be placed in a north house, or other situation where they will not get more heat in the night all through the season than just sufficient to keep out frost. They will not suffer from this treatment, as they are not subject to mildew. By being thus retarded through the winter and spring, these Acacias can be kept back until the beginning of May. It is well to retard a portion of the plants as late as may be, as they are much more useful in succession. After flowering, cut well back to within six or eight inches of where they were shortened to the preceding year. This will tend to keep them from getting too large, and will prevent their becoming bare of leaves. When they have broken, a portion may be moved on into larger pots, and some kept for the season in those they already occupy, and assisted whilst making growth with manure-water. Treat through the autumn and winter as before, and at the time of tying be careful to keep them in regular shape. These plants have a natural tendency to a somewhat upright habit; it is well to let them assume this form so long as they are kept properly furnished at the bottom, and so trained they afford an acceptable contrast to other things of more dwarf-spreading growth. They may, by being well cut back, as advised, each spring, and by a liberal use of manure-water whilst growing, be kept in good condition for years without the necessity for too large pots. If they happen to get bare at the bottom, they will do with cutting well back, and when the young growth has pushed a couple of inches the plants may have a part of the soil shaken from the roots, a portion of the latter cut away, placed in suitable pots, encouraged to make growth, and the strongest shoots stopped back, as in the case of young stock.

The undermentioned are bushy-habited kinds, suitable for pot specimens :—

A. armata. A stout-growing, free-flowering, bright yellow species that forces well. Australia.

A. armata pendula. A drooping-habited form of the above.

A. Drummondii. The most effective of all as a pot plant; of more slender habit than the preceding. Flowers pale yellow. Swan River.

The following sorts are fine for planting out in conservatories, and very suitable for occupying a corner or wall; so treated, instead of being stopped they should be encouraged to grow from the first with a clear stem, and the side shoots should be kept cut in, so as to induce the plants to get up. They look the best when not too closely trained into the wall or pillar, where they may happen to be used, but allowed to hang in a somewhat irregular manner, merely kept from encroaching upon anything near them. The great advantage in growing these plants in such situations is, that they can be cut into whatever space they may be required to fill, without suffering any injury; they do not, when so planted out, want a deal of room to grow in, merely needing, as the soil gets exhausted, the removal of a portion of the top and its replacing by new, and the assistance through the growing season of manure water.

A. dealbata. A large, strong-growing kind, that produces a profusion of lemon-coloured flowers. New Holland.

A. grandis. A handsome species, with bright yellow flowers. Swan River.

A. longifolia. A beautiful, slender-wooded sort. Flowers pale yellow. Australia.

A. lophantha. A strong grower, that produces its yellow flowers freely. It is equally desirable for its ample Fern-like foliage, than which nothing can be more beautiful for mixing with flowers in large vases or epergnes, where it lasts fairly well. Australia.

A. pubescens. An elegant, fine-leaved kind, with charming bright yellow flowers. Australia.

A. Riceana. A tall grower, with drooping habit. Flowers yellow. Tasmania.

INSECTS.—Whenever these Acacias are permanently grown in a conservatory, or other plant-house, care should be taken not to stand anything in contact with them that is affected with that worst of all insects under glass, white scale. If this insect once gets upon them it spreads rapidly; and the plants, in such a position, overhanging others, become the means of affecting all that come near them on which the coccus will live. If they are ever affected with this insect, the only remedy is to cut off in the spring all the branches to the strong wood, and thoroughly scrub with strong insecticide. Whatever dressing is applied it should be used three or four times, at intervals of a few days, before the plants have pushed any buds. Brown scale is more easily dealt with, and may be destroyed by repeated washings of the wood and leaves with insecticide during the season of rest.

ACALYPHA.

These are stove plants with distinct looking foliage, and are suitable for using in the ways that fine-leaved subjects are now so much in demand for.

They can be struck from cuttings of the young shoots or from eyes, which, if put in during spring in sand and stood in a temperature of 70°, kept close, moist and shaded, will soon root; then move them singly into 3-inch pots. They will grow in either peat or loam with a little sand; keep them in a temperature similar to that in which they were struck until established, after which 65° by night will be enough. Let the heat rise in the day according to the state of the weather, giving air and shade when sunny, and keep them near the glass. Nip the points off the leading shoots, and give pots two or three sizes larger about the end of June, continuing to treat as before. They will make useful decorative stock by autumn, and are most serviceable when of moderate size struck annually.

A. marginata. A free-growing handsome kind; centre of leaf reddish brown, edged with carmine. South Sea Islands.

A. obovata. A distinct and handsome kind; in the early stages the leaves are green, edged with creamy white, and as they get older the marginal colouring assumes a crimson hue. South Sea Islands.

A. Wilkesiana (syn.; A. tricolor). A handsome species; leaves metallic green ground colour, deeply marked with reddish crimson. New Caledonia.

INSECTS.—Red spider and mealy bug sometimes affect them, and are best kept under by a free use of the syringe and sponging.

ACANTHOPHŒNIX.

The few species of this genus of Palms known in cultivation are pretty habited plants that attain a medium size. They require stove heat to keep them in good condition. Propagation and cultivation given under Palms, general details of culture.

A. crinita (syns.; Areca crinita and Calamus dealbatus). A species with elegantly curved, plumose pinnate leaves, pale green above, white on the under side; the stalks are armed with strong spines. This Palm often has a yellow, sickly appearance, and on that account is not equal to many in cultivation. It is indigenous to Madagascar and the Isle of Bourbon.

ACHIMENES.

Many of the present race of these beautiful free-flowering plants are garden hybrids, produced by crossing the different species introduced from Jamaica and South America, the progeny of which are very handsome. They have many properties that commend them to the general cultivator, amongst which are the ease with which they can be grown, their long-continued blooming, and also their ability to bear when in flower a considerably lower temperature than the stove; their suitability for conservatory decoration during the summer season, when the greater number of plants have done flowering, makes them valuable for using in this way. They are deciduous herbaceous plants, forming scaly roots that rest through the winter, during which they should be kept in dry material. This should be either sand or soil, and they may be put away anywhere in a dry place where the temperature does not fall below 50°; much lower than this they are not safe for any length of time, as, if kept too cold, they decay. Although the flowering lasts for a considerable period, still it is well to start them into growth at different times, so as to have a succession. If some are required early, say in June, a portion should be started about the end of February, with a second lot at an interval of a month or five weeks. When commencing prepare some ordinary seed pans, proportionate in size with the quantity of each variety to be grown, and put in the bottom of these a few bits of crocks, on which place the soil. They will thrive in either peat or loam, mixed with leaf mould and rotten dung, to which add sand in proportion to the more or less heavy description of the soil used. As these pans are merely to start them into growth, after which they are to be transplanted, the soil should be of a very light character, so that they may be moved from it without injuring the young roots, a circumstance that will occur if material of an adhesive nature is used. If peat of a fibrous description is employed, add one-fifth of leaf mould; if loam, put an equal quantity of leaf mould along with it; fill the pans two-thirds their depth with the soil, and then place the roots an inch asunder evenly upon it, and over them put an inch of soil, which should be in a medium condition between wet and dry. Place the pans in the stove at the coolest end, if this will afford them a night temperature of 60°; do not give any water until the roots have commenced to grow (unless the soil has obviously got too dry) or they may rot. As soon as the shoots make their appearance above ground, stand the pans as near the light as possible. If there is a shelf overhead close to the roof glass, this will just suit them. If kept in a dark place they will directly become drawn and weak, a condition that spoils them. When the young shoots are about three inches in length they should be moved into their flowering pots, and now it must be determined what sized plants are required. They may be placed in 7 in. or 8 in. pots, or in such as are up to 12 in. or 14 in. in diameter, according to the purpose for which they are wanted A medium size in most cases will be the most useful. Drain the pots well, add to the peat or loam, whichever they are to be grown in, a moderate quantity of rotten dung and leaf mould and a sprinkling of sand; press it moderately firm, and fill the pots up to within 2 inches of the rim. Then put in the plants about 2 inches apart, and place an inch of soil over the roots, pressing it slightly down, and replace as before in a light situation. As the days get longer the temperature may be increased 5° in the night, and be made proportionately higher in the day; give a slight shade in very bright weather, and air in the middle of the day. As growth advances, a neat stick, proportionate in length with the strength of the variety, should be put to each shoot, which should be tied so as to have the whole shapely. As the soil becomes filled with roots a plentiful supply of water should be given, and the plants freely syringed overhead every afternoon. When the flowers are fully formed, and before they begin to open, if it is intended that the plants should be moved to a cooler house when in bloom, they ought to be gradually inured to the change by placing them where they will get more air, with, if possible, a little lower temperature. They should not be submitted to too great a change all at once, as, if checked, they sometimes do not open their flowers freely. When in bloom do not let them suffer for water, or the flowering will be soon over. When they have done blooming, set them in the corner of a house where they will be kept moderately warm, and supply them regularly with water, as, if neglected, either by a deficiency of this or by being stood where they are too cold, they form very poor roots for the ensuing year. Attend to them in this way until the tops gradually die down, when the roots can be either allowed to remain in the ball of dry earth by setting the pots in a place with a suitable temperature, as advised already, or they may be shaken out and put in paper bags in a little dry sand, so as to keep the air from them. Achimenes make excellent basket plants for suspending in conservatories or similar places. When wanted for use in this way the baskets should be made of galvanised iron wire, proportionate in size to the place they are intended to occupy. They should be first lined with a couple of inches of clean moss, upon which put the same depth of crocks or broken charcoal —the latter is much the lightest—fill up with soil as in the case of pots, and plant similarly. When required the outside shoots may be tied to sticks in a horizontal position over the sides of the baskets, the inner ones being tied so as to furnish the upper surface, to make the whole shapely. So managed they are very effective. Plants for successional flowering require treating similarly in every way, except starting into growth, as already said, somewhat later. Any variety that happens to be scarce can be increased readily from cuttings made from the young shoots, in lengths of two or three joints, cutting them at a joint to form the base; insert in pots or pans filled with half peat and sand, place in heat, keep moist, and cover with a propagating glass.

New varieties are being continually raised from seed, but the undermentioned are all good kinds and deserving of a place:—

A. Admiration. Rose colour with light centre.

A. Ambroise Verschaffelt. A fine white sort, with the centre marked with dark rays.

A. Aurora. Scarlet, with yellow eye; very large flowers.

A. Firefly. Deep carmine, spotted with crimson, yellow eye.

A. Ghiesbreghtii. A Mexican species, with scarlet and purple flowers.

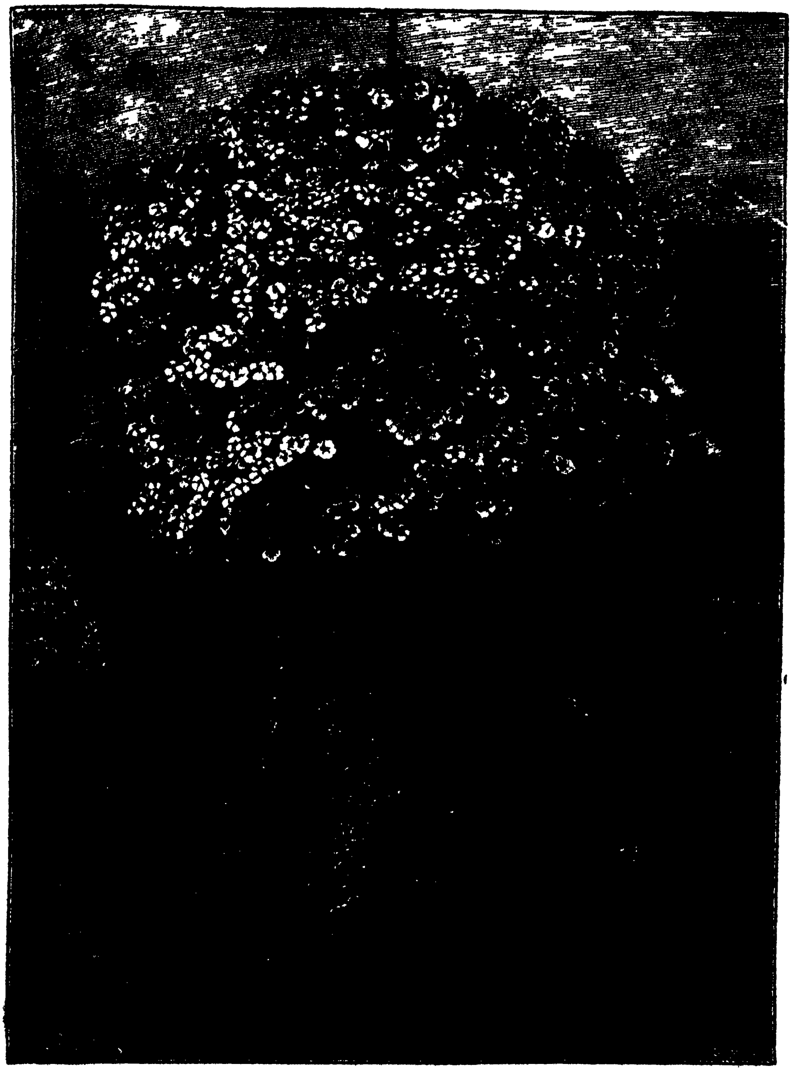
A. gloxiniæflora. Also a Mexican species; the flowers are white. A distinct and desirable plant.

A. grandiflora. Another Mexican species, a tall grower, the flowers of which are reddish crimson.

A. longiflora alba. Large flowers, white, slightly marked in the centre.

A. longiflora major. A very fine blue sort.

A. Masterpiece. A stout-growing variety, with violet-rose coloured flowers.



ACHIMENES IN BASKET. *To face page 20*

A. Mauve Queen. Mauve-coloured flowers; a very fine large-flowered kind.

A. patens.—Fine violet, the flowers large.

A. picta.—Flowers yellow and scarlet; a dwarf-habited species from Mexico.

A. Pink Perfection. Magenta shaded with violet, carmine eye, flower large.

A. Rose Queen. Purple and rose, with yellow throat; very compact habit, profuse bloomer.

A. Stella. Magentas potted with carmine, orange eye, flowers serrated on the edge.

A. Williamsii. Vivid scarlet, large flowers; compact branching habit.

INSECTS.—Achimenes are not so subject to insects as many occupants of the stove, although mealy bug will live upon them, and, when once they get affected with this pest, there is not much chance of removing it in any way but with a small brush and sponge, as the nature of the plants is such as not to bear washing with any insecticide that will kill the insects. They are also liable to the attacks of red spider, which must be guarded against by a diligent use of the syringe.

ACROPHORUS.

A small genus of Ferns, nearly allied to Davallias, and comprising both stove and greenhouse species. They are low growing kinds with creeping rhizomes and have pretty fronds partaking much in appearance of the smaller kinds of Davallia. The undernamed are worth a place.

For propagation and cultivation, see Ferns, general details of culture.

STOVE SPECIES.—*A. affinis.* Borneo.

GREENHOUSE SPECIES.—*A. hispidus.* New Zealand.

ACROPHYLLUM VENOSUM.

This evergreen greenhouse plant is a native of New Holland, and is difficult to grow. It does not die outright, like many other hard-wooded plants, but gets into a stunted condition. It will often remain in that state for years, but seldom recovers. If from any cause whatever the small feeding roots die, the loss is generally confined to them, the thicker roots retaining their vitality, but they appear seldom to have the power of pushing out fresh feeders, hence the lingering condition. To grow it successfully it requires the best soil that can be got, soft water and close attention. On no account should it be allowed to stand out of doors, not even in the finest summer weather. In one respect it differs from most other greenhouse hard-wooded plants—it will not long bear being under the full influence of the sun in a light house during the summer. At that season it does better in a darker, and what for most plants would be a worse, structure, where the sun's rays are less powerful. This points to the necessity of using a thin shade in very fine weather. The most usual way of propagation is from seed, which the plant produces freely; it should be sown in autumn as soon as ripe in pots drained and filled with fine sifted peat and sand, the seed covered very lightly, and the soil kept damp but not wet. The seed will vegetate in a temperature of 50° by night, and proportionately higher in the day. The seedlings will not be ready for pricking off before spring, at which time they should be put in 2 inches apart in pans filled with soil similar to that in which the seed was sown. The after treatment required will need to be like that of plants struck from cuttings, a method of increasing this Acrophyllum which we much prefer for adoption in private gardens on account of the many inferior forms of the plant that always appear amongst seedlings. Cuttings of this plant take longer to root than those of most others, and should be taken off with a heel to ensure their succeeding. Young shoots suitable for the purpose can usually be had towards the end of summer, from about the collar of medium sized or large plants, or from strong shoots that have been cut back to a joint of the hard mature wood. They should be taken off when 3 or 4 inches long, and the wood three-fourths matured, with a heel as already advised, and put 2 or 3 inches apart in 5 or 6 inch pots, filled with sand. They must be kept close and moist in a greenhouse temperature through the winter; when the base of the cuttings is callused over, put them in a moderate stove temperature, where they will root in a short time. By the beginning of June they should be rooted sufficiently to bear moving singly into 3-inch pots filled with fine peat and a little sand. They must be kept close until they begin to grow, when give a little more air, but still let them have intermediate heat and be shaded from the sun; pinch out the points to make them break back and syringe every afternoon when the house is shut up. Continue this course until the middle of September, at which time admit a little more air, but do not let them be too cold during the winter. 45° or 48° in the night will keep them moving slowly, which is better than total cessation of growth with this plant in its first stages. In March, move into 4 or

5 inch pots, and again stop the strongest shoots, tying them out horizontally whilst young, as the wood is naturally hard and does not bend well when it has attained much strength. After they have got established in the new soil, a greenhouse temperature a little closer than required by larger plants will be best, with shade from the full force of the sun, and dewing over with the syringe when shut up in the afternoon. Give more air in the autumn, and winter in a temperature of from 40° to 45°. In March, give pots 3 inches larger, using the best fibrous peat, carefully broken with the hand, and rejecting all the small particles; add about one-seventh of sand, and use the potting lath, so as to ensure that the soil is made thoroughly firm. After potting, place the plants where they can again be kept a little close; shade when the sun is bright, and keep the surface they stand upon syringed two or three times daily, after which give more air, but never allow them to stand in a cold current. Close the house early, so as to shut in a little sun-heat; continue to syringe the stage all about the pots, as well as overhead, at the time of closing through the summer, which will greatly assist their growth.

Train out, so as to lay the ground-work for the future specimens, and bring the strongest shoots the lowest, which will balance their growth. The plant does not like much stopping, which should not be resorted to except in the case of shoots that are much the strongest. Training as described above will generally cause them to break back sufficiently to furnish the plant. Towards the end of August discontinue syringing, and do not close the house as heretofore. During the winter keep the plants somewhat drier at the roots, with a night temperature similar to that of last year. Towards March, if the roots are active, move into pots 3 inches larger, using soil similar to last season. The plants will flower in May, and, as soon as the blooms have decayed, remove them at once, for if they are allowed to seed growth will be much retarded. It requires considerable care in removing the flowers not to destroy the points of the shoots, which grow right through the flowers, as, if those tender points are injured, they will have to break from the joint below where it has flowered, and the wood is so hard that it does not break freely. Let the general treatment be like that of last season. Through the summer and following winter attend to tying and training as before, and as soon as the roots are in motion give pots 3 or 4 inches larger, according to the quantity of roots the plants have made, using, as before, the best peat, broken now a little larger. Treat generally as in the previous season. The plants will now be getting nice specimens, and may be expected to bloom freely; place them when in flower where they will be well shaded from the full sun; by this means their flowering will be prolonged. Each succeeding season attend to their potting, &c., as before. For although, as mentioned at the commencement, the plant is a ticklish subject, sometimes it will go on for eight or ten years.

We would also particularly direct attention to close observation in the application of water. We feel convinced that the want of success with this, as well as many other plants, is attributable to a uniform system in the operation of watering. To any one who attentively considers this matter, it will appear obvious that a plant like the Acrophyllum, with a considerable amount of leaf surface, will necessarily lose a great deal more by evaporation than a plant with small hard leaves—such, for instance, as the Aphelexis. Consequently, it should receive water before the soil becomes so dry as in the case of the latter plant. By such treatment we have found it thrive well, and amply repay the attention bestowed upon it by yielding a profusion of its beautiful Spiræa-like flowers, which, if kept shaded from bright sun, will last three or four weeks. The plant is so remarkably distinct in both flower and foliage, also so much less formal in its general habit than other hard-wooded greenhouse plants, as to render it a most desirable addition to even the most select collection.

INSECTS.—It is not subject to the attacks of any insect excepting scale, which must be carefully removed with a sponge, for although the leaves have a hard appearance they are extremely impatient of rough usage. We have seen a plant completely spoilt by the scale being removed from its leaves with a small brush made for the purpose, although used with care; in a few days after the leaves showed the mark of every bristle just as if they had been scratched with a pin. Very little injury causes the leaves to turn yellow and fall off, which much injures the plant; for any mutilation of the leaves has a greater effect upon the roots of the plant than any other with which we are acquainted

ACROSTICHUM.

A genus of stove Ferns, few in number. They are mostly from the Eastern hemisphere, and distinct in appearance; but

from the cultivator's point of view are inferior to many.

For propagation and cultivation, see Ferns, general details of culture.

A. aureum. West Indies.

A. flagelliferum. East Indies.

ADELOBOTRYS LINDENII.

A stove plant of secondary merit, that bears white and purple flowers in the spring or summer.

It is a Melastomaceous species, requiring the same treatment in propagation and after-growth as Lasiandra macrantha, except that it does better with a little more warmth than the Lasiandra. A native of Brazil.

INSECTS.—Red spider, scale, and mealy bug, will all live on the plant, a constant use of the syringe through the growing season, with sponging, is the best means to keep these pests down.

ADENANDRA.

Adenandras are strong-rooted greenhouse plants, much more so than the generality of hard-wooded kinds that are also natives of the Cape, or such as are indigenous to New Holland. Consequently they are not so delicate as the finer-rooted plants, neither are they so liable to injury from being used for conservatory decoration, as is the case with such as are naturally less vigorous in constitution.

Adenandras are easily propagated from cuttings of the young half-ripened shoots, such as the plants produce after flowering; these should be in right condition about the middle of summer. Put the cuttings an inch apart in pots filled with sand, covered with a propagating glass; keep them moist, warm, and shaded. When they are rooted move singly into small pots, using peaty soil. Pinch out the points as soon as the little plants begin to grow freely, keep them near the glass through the autumn and winter in a temperature of 45°, or a little over; about March move them into 4-inch pots, using soil as before. In midsummer again pinch out the points of the shoots, and subject them to ordinary greenhouse treatment; if full of roots in July move them into pots two inches larger. Encourage growth and winter in a temperature such as the general young stock of hard-wooded plants require—from 40° to 45° at night is about the range that suits most species best while in a young state. So treated their roots will be early in action, and admit of their being potted by the middle of March. Some growers use loam for Adenandras, others prefer peat; the latter we consider more in accordance with the requirements of the plants, as they will last and keep in good condition longer in it than in loam. We have also found them grow quicker in peat, which should be of a good fibrous nature; but if a little harder for these plants than is required for some, it will be all the better. Break it, as usual for young stock, about the size of acorns, and add one-seventh sand, which mix thoroughly with the peat. Give them a 3-inch shift; drain well. This is the more necessary, as when in full growth they require more water than some others. Nip out the points of all the shoots at the time of potting, so as to induce them to break freely; place in a house where they can for a few weeks be kept a little closer, standing them on the usual bed of damp, moisture-holding, fine ashes. This will prolong the time during which they will not require water after the shift, and enable the roots to take to the new soil. Do not allow them to become too dry, so as to flag at all, or their leaves, which are more ample than those of many plants of similar nature, will most likely suffer. Shade slightly for two or three weeks, and tie the strongest shoots well out, bringing them right down to the rim of the pot. It is necessary to see to this early, as these plants are disposed to an upright habit of growth, and if the most vigorous branches are not brought down sufficiently low from the first, they not only become too stiff to bend freely, but the weaker shoots are not able to get on more equal terms with the strong - a necessary condition in hard-wooded plant growing that should never be lost sight of. Adenandras are fairly even growers, and do not usually require any stopping or training through the season after this spring tying; but if any of the shoots have a tendency through the summer to outgrow the others, despite the tying down, they may be shortened back a little so as to equalise their growth.

As the spring advances give more air, syringe the plants freely every afternoon, close the house early, and damp the material on which they stand in the mornings, which will assist them through the hottest weather. Shade slightly during the middle of the day. By the end of June their roots will have taken complete possession of the new soil, and will require more room. Move them on into pots 3 inches larger, using soil in every respect similar to that into which they were removed at the earlier shift. Give extra shade for a few weeks, with abundance of water thrown about the house, and continue the use of the syringe until the end of August, when it will be well to dispense with it; also allow the house to become considerably drier, to ripen up the growth. Give plenty of air during the day, and leave some in at the top lights during the nights through the autumn, so long as there is no danger of frost. Winter them similarly to the previous season, and give just as much water as will keep the soil in a healthy condition. The roots of these plants are rarely, when in health, quite at rest. Pot again in spring, about the time recommended the preceding year, giving a 3 or 4 inch shift, according to the strength of the plants. Use the soil in a little coarser state, adding sand in similar proportions as heretofore advised. Pot hard, and train the shoots well out, as before. It is not likely the plants will show much flower this spring on account of their non-exposure to the open air the summer previous; neither is it well they should, as it would somewhat interfere with the coming season's growth, when, if all goes well, they will make progress such as to bring them up to a useful decorative size. Take out the points of the shoots, as recommended last season, but not before the end of April; if done before this time they will set bloom sooner than they should, and will come into flower before the time when they are required the following spring. When the shoots are shortened back let it be evenly done all over the plants, so that they may be able to make a regular growth, which encourage by maintaining a moist growing atmosphere, through applying water freely to the paths and stages. Give air early in the morning, and in abundance through the day. Syringe the plants well in the evening, and close the house whilst the sun is yet upon the glass; shade slightly in very bright weather in May, June, and July, during which latter month they should be gradually inured to more air, given through the nights, with less shade in the day-time.

At the beginning of August turn them outside in the open air, giving them for a week or so a little protection from the sun in the middle of the day, after which fully expose them, protecting the pots from the direct rays of the sun. Syringe overhead every evening in bright weather, but do not allow the plants whilst out to get too much drenched with rain. They may remain out-of-doors until the middle of September, after which it will not be safe to risk them, for fear of frost; give them a good light situation through the winter, during which time they should be nicely tied with new sticks, and trained into proper form. They are not difficult plants to manage in this respect, from their natural even habit. In the spring they may be expected to show flower from every shoot, which will open through April or May, when they will make useful decorative plants, and can be removed to the conservatory or show-house. After their flowering is over cut the shoots back about half-way between the extremities and the point they were cut to last year. If only just the points of the shoots are removed the plants get too tall, and have an unsightly appearance. Give them a good syringing so as to remove any dust that may have accumulated upon the leaves during their flowering time; remove them back to the hard-wooded house, and assist them to break by slight syringing in the afternoons, keeping them in a little closer. When the young shoots have grown half-an-inch or so, repot, giving a shift according to the amount of roots they are found to have when turned out of the old pots, and encourage them to grow freely by keeping the atmosphere moist, and by giving a little shade during the middle of the day. Inure them to more air, and decrease the shade through July, after which turn them out-of-doors, and treat as advised the preceding season. It must be borne in mind that Adenandras require this open-air exposure to insure their flowering. By the end of the season they will have arrived at a good specimen size, and will, if required, do well for exhibiting. Treat through the autumn in accordance with the directions previously given; but now winter them in a temperature some 5° cooler, or they may flower earlier than required. Let their subsequent spring treatment be the same as last year, except that they will not need potting this season. Give them a shift after flowering the next year, and, when they require it, they should be assisted with weak manure-water whilst making growth.

A. fragrans. Is worthy of a place in every greenhouse for the agreeable perfume of its flowers alone. Apart from this, when well bloomed, it is an attractive plant.

A. speciosa. This is sufficiently distinct from the above to be desirable.

INSECTS.—Adenandras, treated as advised, will last for some years, if kept free from red spider, which must be diligently sought for during the growing season, as, if it gets to a head, the leaves will be de-

Maidenhair Fern in basket. *To face page 24.*

stroyed, and both the health and appearance of the plants spoilt.

ADHATODA CYDONIÆFOLIA.

An evergreen stove species, the only representative of the genus often met with. It is usually treated as a climber, though it can be flowered in the ordinary bush-trained form. The flowers are white and purple, and are produced in autumn. Though a distinct-looking plant, it is less effective than many that will conform to like treatment. It strikes readily from cuttings of the young shoots in spring, kept in a brisk heat, and when rooted potted singly and grown in a moderate stove temperature. If the intention is to use the plants as climbers the shoots should not be stopped, but if wanted to flower in bush form, the points ought to be pinched out as soon as they begin to grow freely, using a few sticks for support afterwards. It comes from Brazil.

INSECTS.—Mealy bug, and scale, as well as the less injurious insects, affect this plant. To keep them down, syringe daily during the growing season with water, and dip in insecticide.

ADIANTUM.

A very extensive genus of Ferns, found growing naturally over a great portion of the globe, but mostly avoiding cold or very hot regions. They comprise both stove and greenhouse species, and are particularly handsome, many of them being especial favourites with cultivators.

For propagation and cultivation, s Ferns, general details of culture.

STOVE SPECIES.

A. amabile. Peru.
A. Bausei. Of garden origin.
A. brasiliense. Brazil.
A. cardiochlæna. Tropical America.
A. caudatum. East Indies.
A. concinnum latum. West Indies.
A. cultratum. Brazil.
A. curvatum. Brazil.
A. decorum. Peru.
A. Edgworthii. India.
A. farleyense. Barbadoes.
A. Feei. Mexico.
A. Henslovianum. Peru.
A. Kaulfussii.
A. Lathomii. A garden variety.
A. lunulatum. East Indies.
A. macrophyllum. West Indies.
A. peruvianum. Peru.
A. Sancta Catharinæ. Brazil.
A. scutum.
A. Seemannii. Central America.
A. tenerum. Jamaica.
A. trapeziforme. West Indies.
A. Veitchii. Peru.
A. velutinum. Colombia.
A. Wilesianum. Jamaica.

GREENHOUSE SPECIES.

A. chilense. Chili.
A. cuneatum. Brazil.
A. excisum multifidum.
A. formosum. Australia.
A. gracillimum. Of garden origin.
A. hispidulum. New Holland.
A. Lawsonii.
A. Luddemanianum.
A. palmatum. Peru.
A. reniforme. The Azores.
A. tinctum. Peru.
A. Williamsii. Peru.

ÆCHMEA.

Amongst the large number of Bromeliaceous stove plants in cultivation there are several Æchmeas that occupy a very high position, as well for the varied beauty of their flowers as for the graceful vase-like form of the plants, produced by the peculiar elegant curvature of the leaves. From the many desirable properties which they possess, it would be difficult to imagine any plants more worthy of general cultivation. They are easily grown, and their moderate size makes them suitable both for the largest establishments and for places where the space devoted to plant-growing is limited. The different species flower at different times in the year, thus affording a welcome succession in their bloomings. Some last in beauty for several weeks; others, like the handsome medium-sized Æchmea fulgens and Æ. discolor, with their intensely red flower spikes, remain very attractive objects for months after the actual flowers are gone, their appearance being such as to require close examination to determine whether the blooms are closed or yet to open. Several of the species are of a partially epiphytal nature, growi in the shady forest between the forked branches of trees, sustained in part by the decayed vegetable matter lodged there, and probably in some cases extending their roots down the trunks to the ground, where they will obtain additional nutriment. From this it will be easily understood that the roots of these plants do not like to enter soil that is of a close adhesive nature, requiring it to be the opposite—loose, fibrous, and open—although there is some difference in the ability of the different species to exist in soil of a nature not in accordance with their wants in the above respect. Still, no mistake can be made in growing all the under-mentioned in peat as full of decayed fern roots and other vegetable fibre as can be got, and it will be advisable to add a seventh part of charcoal, or crocks broken about the size of horse beans; to this put a moderate quantity of sand, and mix the whole well together. In this soil they will not only make roots freely, but the roots will live much longer—a circumstance that has a deal to do with the number of suckers the plants are able to throw up after flowering, and on which in a great measure depends the rate of increase in things of this nature that are slow to propagate.

The several species form from the base of the full-grown plants, about or after the time of blooming, suckers like most Bromeliads. These should be allowed to remain upon the old plants until they have attained a considerable size—say one-fourth that of the crowns from which they spring. It is important to leave them attached to the parent plant until they have got something like the above size, as, if removed too young, they are long in making much progress. When thus allowed to attain a fair size before being taken off, they will generally be found to have a number of roots just breaking round the base. The suckers will usually be in a condition to take off in the autumn. Slip them off with the fingers, and be careful not to injure these incipient roots; they may also be taken off with the help of a sharp knife. In this condition they will root into the soil immediately. Put them singly in from 3 in. to 6 in. pots, according to the size of the suckers; drain the pots well, and for this first potting sift the soil, forcing all the fibrous portion through the sieve, and add more sand (about one-fifth) than will be required when the plants get larger; give a moderate watering at the time they are put in, and place them at the warmest end of the stove, in a temperature of 65° or 70°. If a little bottom heat is at hand, it will assist the formation of roots; but do not cover them with a propagating glass, as the hard close texture of the leaves is of a nature that allows little loss by evaporation, consequently they do not flag when exposed in the atmosphere of the stove, as would be the case with ordinary cuttings of most things. Kinds, such as Æ. fulgens, that form a few inches of stem below the point where the leaves are emitted, simply require inserting in the soil up to the base of the leaves; in the case of species that do not make any length of stem, it will be necessary to strip off a few of the bottom leaves before putting them in. Keep them through the winter in a night temperature of 60°, with 5° higher in the day, place them in a light position, and let the soil be moderately moist.

By the beginning of March, as the days get longer, raise the temperature 5° during the night, and 10° during the day; about the end of the month move them into pots one or two inches larger, according to the size of the plants, using the soil in a rougher state, and adding crocks or charcoal, as already advised. The pots must be well drained, and must not be used too large, as the whole of the different species do not like too much root-room. When the sun gets more powerful, shade will be required in the middle of the day. By the beginning of May the temperature should be increased to 70° in the night, and proportionately higher by day, giving air in good time, but closing early in the afternoons. A slight syringing at the time of shutting up will assist growth. Continue this treatment through the summer months, always keeping the soil moderately moist, as, if allowed to become dry at any time, the plants will be injured. At the end of August dispense with shading and give more air; as the autumn advances reduce the temperature down to the point recommended for the season previous, and winter similarly. As the days again lengthen increase the temperature, and move them into pots two inches larger, using the soil in a more lumpy state. Treat as in the preceding growing season as to heat, shade, and moisture. In the course of the summer the plants will push up their flowers, and as they open may, if required, be placed in a warm conservatory, but must not be set where they will be subject to a current of air, neither must they be exposed to the sun. When done blooming move them back to the stove, and treat as before. Suckers will now be formed, and when large enough should be taken off and treated generally as already advised. The old plants should be kept, and, if well cared for, will through the spring push up more suckers, which can, when they have attained sufficient size, be taken off and struck as recommended for those first produced.

The following species, though differing much in size and general appearance, will all succeed under similar treatment; of course proportioning the size of the pots in which they are grown to that which the different kinds naturally attain.

Æ. *fulgens*. Bears bright red, erect flower spikes, that have the appearance of branching sprays of coral, and last and retain their colour for months after the flowers are gone. It is one of the best comparatively small growing decorative plants in cultivation. When grown in 6 in. or 8 in. pots it is especially useful for standing during the summer months in a conservatory, where its intense colour contrasts well with other things. From Cayenne.

Æ. fulgens discolor is a variety of the above, requiring similar treatment.

Æ. Furstenbergii. A Bahia species of decidedly distinct character, with stout, long, spiny-edged leaves. The panicles of flowers are large, with rose-coloured bracts and bracteoles.

Æ. hystrix. A large-growing handsome-leaved species. The flower-stalk is longer than in most of the Æchmeas, and the violet flowers are densely packed on the spike. It comes from Cayenne.

Æ. Mariæ Reginæ. A truly regal plant from Costa Rica; it is of stately growth, the leaves are 18 inches in length and gracefully curved. The flower-spike, which is from twenty inches to two feet in length, springs from the centre; it is erect and partly clothed with ample deep rose-coloured bracts, which retain their colour for many months. The flowers are tipped with blue, and as they get older change to a salmon colour. It blooms in July.

Æ. miniata. A smaller habited kind than Æ. Fulgens, with darker foliage; the individual flowers, as well as the whole inflorescence, are smaller than those of Æ. fulgens.

Æ. Veitchii. A handsome species, which bears a dense head of flowers, scarlet in colour, as are also the bracts. From Colombia.

INSECTS.—Æchmeas are not very subject to the attacks of insects. Mealy bug and scale will live upon them, but the texture of the leaves is such as to admit of these being easily removed by sponging and a free use of the syringe.

ÆSCHYNANTHUS.

These are beautiful free-flowering stove plants, possessing a very distinct habit of growth; they are mostly indigenous to the hot, damp, woody districts of Java, and consequently will bear and require a high temperature to grow well. Their splendid scarlet and yellow or deep crimson flowers are produced freely from the axils of the leaves and extremities of the current season's shoots. In their native habitat they are of an epiphytal character, growing on the trunks and branches of trees, to which the roots cling like our native Ivy. In a cultivated state they are of moderate growth, and are especially adapted for growing in pots or baskets, suspended in the stove over paths from the rafters; so managed they are very effective, and supply a place for which comparatively few things are suitable. Their blooms are borne in succession over a considerable period during the summer and autumn months, at which time they form an agreeable contrast to other plants. They flower freely in a small state, consequently are suitable for either large or small houses.

To grow well they require too much heat to succeed satisfactorily all the year round in an ordinary Fern-house, but should be kept in the stove whilst making their growth and until the flowers begin to open; they can then be removed to a conservatory or Fernery, and in the latter situation they have a beautiful effect, with their bright-coloured flowers drooping over the varied green fronds of the Ferns. All the kinds root freely from half-ripened cuttings taken off in the spring, inserted in small pots in half sand and peat, and kept close in a propagating frame or under a bell glass; they will do without bottom heat, provided the temperature of the house is sufficient to promote growth. Cuttings may usually be had in right condition about the beginning of April; these, if placed in a night temperature of 70°, will root in a month, when they may be gradually inured to the full air of the house, the glasses tilted a little more each day until they can be dispensed with altogether. Pinch out the points of the shoots at a few joints above the base, to lay the foundation for the future plant by inducing the formation of several shoots. As soon as the pots are filled with roots, remove into others a couple of inches larger, using fibrous peat, to which add one-sixth of sand and crocks broken small, in equal parts; this will be found to suit the roots better than a closer material. Fill the pots to one-fourth their depth with drainage, as these plants cannot endure stagnant moisture; at the same time, during the growing season they require an abundant supply of water to the roots, and this necessitates provision being made for its passing freely off. They should be stood on a front shelf, where they will receive a fair amount of light, but should have a thin shade in the hottest part of the day. As the season advances keep the temperature at from 65° to 70° in the night, allowing it to get 10° higher when the sun is upon the glass, giving air when required, and syringing overhead when the house is closed.

By midsummer again pinch out the points of the shoots, which will now begin to assume their natural drooping habit, to admit of which the plants may be stood upon inverted pots. Continue to supply *them with moisture, heat, and shade through the summer months, again pinching out the points of the shoots about the middle of August. Dispense with shading* as the sun declines in power, and cease syringing, giving more air and less atmospheric moisture. Keep them through the winter in a temperature of 60° in the night, and a little higher in the day time, and give as much water to the soil as will keep the roots a little moist; at the end of March move into pots two sizes larger, using the soil in a little rougher state, adding crocks and sand as before, and draining the pots similarly. The shoots must not be stopped now, or the time of flowering will be delayed; treat as advised in the preceding summer as to heat, shade, and moisture. By midsummer the early blooming sorts will show flower; the later kinds, such as Æ. splendens, further on. When the blooms open the plants may be kept in the stove, or removed, as already stated, to a somewhat cooler house for a few weeks, but they must never be submitted to a cold dry atmosphere. When done flowering replace in the stove, and at once cut back the whole of the growths to within 8 or 10 inches of the base. If this is not done, they will get into a straggling condition, with their flowering shoots irregularly placed, and will be destitute of healthy young leaves near the base, so essential to their fresh pleasing appearance; and if the shortening is deferred until spring, considerable time will be lost, and so many blooming shoots will not be formed. The cut-back shoots will break and make some growth before the end of the season, and if in good healthy condition at the roots, a number of young growths will push up from the base.

Keep through the winter as in the season before, and again repot in the spring, giving a 2-inch shift. They may be hung up by wires fastened round the pots below the rim and joined above the top of the plants, or the pots may be plunged in wire baskets, and the space betwixt the pots and the sides of the baskets filled up with moss; in this way they look much the best, and broad shallow pots should be used. After potting, treat generally as in the preceding summer. This season, if all goes well, they will make many more shoots, with a proportionate increase of flowers. They will be benefited by manure-water once or twice a week. After they have bloomed cut them well in as before; in the spring they may have a portion of the old soil removed, but the roots should not be disturbed too much. Replace with new, and return them to the same pots, if these are deemed large enough; *if not, they may be put in others an inch or two larger. In this way they will last for years.*

The following are sufficiently distinct to merit a place wherever plants in hanging baskets are held in estimation :

Æ. Boschianus. A distinct and pretty species from Java; the flowers are brilliant scarlet and yellow. It keeps on blooming for a considerable portion of the summer.

Æ. fulgens. A handsome species, with bright scarlet flowers, produced freely. From Moulmein.

Æ. grandiflorus. This species comes from Khoseea, and will bear a considerably lower temperature when at rest than the other kinds that have been introduced from Java; its tube-shaped flowers are produced in bunches, and are of a bright scarlet colour suffused with yellow. It blooms in August and September.

Æ. Lobbianus. A handsome sort, with scarlet flowers, produced in summer and autumn. It is a native of Java.

Æ. splendidus. This is a garden hybrid, produced between Æ. grandiflorus and Æ. speciosus, and is the finest of the strong-growing kinds. The flowers are produced in bunches of ten or a dozen, and are of the most intense scarlet, the segments marked with blackish brown. It flowers in the summer.

Æ. tricolor. This is a distinct and pretty species, that bears yellow and scarlet flowers. It comes from Borneo.

Æ. zebrinus. A handsome scarlet flowered kind, from Java.

INSECTS. — Æschynanthus are little troubled with the smaller plant pests, such as thrips and red spider, as these can be easily kept down by the use of the syringe, their thick leathery leaves being easily cleansed by this means. Mealy bug and scale will sometimes affect them; these may be kept under by sponging and a free use of the syringe.

AGALMYLA LONGISTYLA.

This miniature creeping Stove Gesnerad is a native of Java, and from its peculiar habit it is well adapted for particular positions. When suspended from the roof of a warm house, where plants of small growth can with advantage be used, it gives the structure a more furnished appearance, and that without injuriously shading the other occupants. Such a position, too, appears to suit it well, and favours the free production of bloom. Like most other plants, the time of its flowering is considerably influenced by the course of treatment to which it is subjected, but it is generally in perfection during the later months of the year, a time when its scarlet or bright red flowers are very effective. They are comparatively large for the size of the plant, and when well grown are produced freely. Being of a creeping habit the stems cling closely to any surface on which it is grown—not unlike the way in which the rhizomes of some Ferns, such as the weaker growing Davallias, attach themselves. The leaves, which are borne on short stalks, are ovate in shape. It may be cultivated in a pot, but, as it is a true epiphyte, it does best on a block of wood—in this way it can be better hung up, and as we have comparatively few subjects of a similar character and so suitable for the purpose, it is well to utilise it in this manner. Its flowers in such a position are also seen to the best advantage.

To commence, procure a rustic-looking piece of dry Oak wood about 6 inches wide, a foot long, and 2 inches in thickness; if charred it will look none the worse and will last longer—a consideration in the case of such plants as this, that have clinging roots that adhere tightly to whatever they fasten upon, and cannot be removed without injury. Fix a copper wire by means of copper nails to each end of the block to hang it up by. Cut a piece of good fibrous Orchid peat about an inch thick and the same size as the block, shake as much of the earthy matter from it as can be done without breaking it, fasten it on the upper surface of the block with fine copper wire, and shake a handful of silver-sand over the peat (this will help to keep it from getting sour). Then take a plant that has been grown in a pot, or cut several of the creeping stems with several leaves to each, and tie with wire or bast on the surface of the peat. Give water immediately, and shade until the roots have got hold. These operations should be carried out in March before growth has commenced. All through the growing season the roots must be kept moist, and even in winter they must never be allowed to get too dry. During spring and summer the night temperature should range from 65° to 70°, and from 80° to 85° in the daytime. In winter it will do at 60° in the night, and a few degrees higher by day. The shoots require little training, simply bending about in such a way as to cover the block. As soon as the flowers make their appearance, do not allow more water to lodge upon them than can be avoided. It is a heat-loving subject, and neither when in bloom nor at any other time should it be submitted to a low temperature or cold draughts.

INSECTS.—With us the plant was never at any time attacked by insects.

AGAPANTHUS.

The only assignable reason why these elegant-habited greenhouse plants are not now so generally cultivated is that they are old-fashioned. They are amongst the easiest of plants to manage, bearing without injury usage that would kill most of the species subjected to pot culture Their gracefully-curved leaves, which in a well managed specimen droop so as to all but hide the pot, render them at all times pleasing to look upon, and when, in addition, they are furnished with their straight erect flower-stems, surmounted by dense umbels of blue or white flowers, there are few more telling plants. In addition to this they last a considerable time in bloom. The flowers moreover are amongst the most useful for cutting, either combined with others for ordinary decorative purposes, or for bouquets; and for the latter use the blue kinds afford a colour that is not over-plentiful in flowers that are of suitable form and of a durable nature.

Agapanthus may be raised from seed, but, except in the case of a new, or scarce kind, the usual course is to increase them by division of the crowns. This can best be done by taking a large plant in the spring just as growth is about to commence and washing all the soil from among the roots, so as to get them disentangled as far as possible without unnecessary breakage; then divide the crowns singly, or in masses of several together, according to the number and size of the plants required. Where there is no object in adding greatly to their number, large specimens may be simply divided into two or four as may be required, with these, as with the single crowns, giving pots according to the size of the divided pieces, potting firm and encouraging growth by keeping them a little close in a pit or greenhouse. All that is required afterwards is to give pot-room as wanted; but it must be kept in mind that these plants will bear confining at the roots to an extent that few will without suffering. When the specimens are as large as required, and are in from 12 to 16 in. pots, they may go for two or three years without re-potting.

They may be wintered anywhere out of the reach of frost, say under a greenhouse stage, or similar place, where there is only a limited amount of light. Give little water through the season of rest.

The following are distinct and desirable kinds :—

A. præcox. Has blue flowers, distinctly suffused with purple. A much scarcer plant than the old species.

A. umbellatus. The best known sort, bearing large umbels of dark blue flowers.

A. umbellatus candidus. A pure white sort. A decided improvement on the old white form.

A. umbellatus floreplenо. A double form of A. umbellatus, with deep blue flowers. A fine kind.

A. umbellatus variegatus. A variegated form, with prettily marked leaves.

The species come from the Cape of Good Hope, A. umbellatus being amongst the oldest introductions we possess.

INSECTS.—Agapanthus are little troubled with insects. Aphides sometimes infest the young leaves, or more commonly the advancing flowers ; when these are troublesome fumigate with some or other of the preparations of tobacco.

AGATHÆA CŒLESTIS.

This is an evergreen greenhouse plant, but nearly allied to Cineraria, sometimes passing under the name of Cineraria amelloides. It comes from the Cape of Good Hope, and its pretty blue flowers are very effective.

It is raised from seed sown in the spring in a little warmth ; when the seedlings have got fairly into growth, keep them in a greenhouse, potting off in sandy loam, and growing on afterwards as ordinary greenhouse plants. There is a variegated form of the plant, A. cœlestis variegata, which succeeds under treatment similar to that given to the original species.

INSECTS.—If affected with aphides or thrips, fumigate or dip in tobacco water.

AGAVE.

These greenhouse succulents are mostly grown for their handsome singular foliage ; they were held in much more favour in times past than at present. When the only medium of heating plant-houses was by the old smoke flue, with its drying influences on the atmosphere of the house where used, Agaves, and other succulent plants, withstood the dry air better than other things, and were consequently more grown. Most of the species are grotesque-looking plants, very easily managed, and requiring much less attention than most things ; their ability to bear without injury an extremely dry condition of the soil that would be fatal to most plants is proverbial. They will stand, when at rest, a temperature anything short of frost, but thrive fastest when kept in a warm but dry atmosphere during the growing season. They require no shade, except such as may be needful to prevent the leaves being burnt through inequalities in the roof of the house where grown. Some of the species attain a large size, particularly the different forms of A. americana, which long had the character of not flowering until the plants were a century old. This idea has no foundation, and is traceable to the fact that the plants are often subjected to a starving course of treatment that prevent their getting strong enough to bloom until they have reached a long age. These Agaves will flower when they have acquired size and strength sufficient to do so, but at the same time it takes many years' liberal treatment to enable them to bloom, so that the flowering of one of these large species is of comparatively rare occurrence. The flower stem rises to a height of twenty feet or more, in the form of an erect, many-branched peduncle, bearing immense numbers of bell-shaped flowers, of a greenish yellow tint, which is the colour, more or less varied, of the flowers of most Agaves. It may be here said that the flowers of these plants are not so much the object of their cultivation ; it is rather their distinct, and in the case of the large kinds noble, appearance when full grown. They have an essentially architectural character, associating well with buildings, in proximity to which, when stood out of doors (treatment which they will bear in summer), they have a fine effect.

They are propagated from suckers, which most of the species, when well grown, produce with more or less freedom. These should be severed from the parent plant in spring just as growth is about to begin, securing as much of the connecting stem as possible, and inserting it in the soil within the pots in which the young plants are to be grown. Place them in an intermediate temperature, such as that of a vinery at work, or anywhere where a little warmth is available ; if such is not at hand they will succeed in an ordinary greenhouse. The pots should be comparatively small, proportionately to the size of the suckers, and they must be thoroughly drained, as anything approaching a stagnant condition of the soil is fatal to the

WINTER GARDEN ARRANGED IN PICTURESQUE MANNER.

Frontispiece.

roots, causing them to rot. The soil should consist of ordinary loam, with a moderate quantity of sand added, and brick rubbish, broken small for young plants, and used in a larger condition as the plants get older. Keep the soil slightly moist, not more, until roots are formed, when more water may be given. The after treatment is so simple that nothing further is required, except to give larger pots as the plants increase in size and give evidence of requiring more root-room; in all cases the pots should be proportionate with the larger or smaller species cultivated. To do justice to the green-leaved or type species of A. americana, they should, when the plants approach their full size, have a box from 3 to 4 feet in diameter, by 2½ feet deep. Many of the small species, such, for instance, as the different forms of A. filifera, do not require, even when full grown, pots above 8 or 10 inches in diameter. In the growing season the plants should have plenty of light and air, so as to keep the leaves from being drawn weak and flabby; this is especially necessary with the longer leaved kinds. Spring is the best time to repot, and afterwards for some weeks give no more water than just enough to keep the soil in a healthy condition; when growth has fairly begun more may be used. As they cease growing in the autumn, reduce the water, keeping the soil only a little moist through the winter. Most of the species will succeed in a greenhouse temperature, but make more progress in an intermediate heat, say from 45° to 50° in the night, with a little more by day in winter, and in summer 60° in the night, with from 70° to 90° by day, according to the weather. Nearly all the species are indigenous to South America or adjacent parts.

The following are distinct and handsome kinds:—

A. americana. The largest species, requiring much the most room when it has attained anything like full size.

A. americana aurea variegata. Has deep rich yellow variegation.

A. applanata. Leaves broad and short, armed with brown spines.

A. Besseriana amœna. A miniature species; leaves yellowish white, with dark spines.

A. dealbata. A strong-growing kind, with long narrow leaves, recurving as they get older.

A. De Smetiana. A rare species; leaves ovate, green, armed with reflexed spines.

A. filifera. . A compact-growing species; leaves 10 or 12 inches long, with white filaments, strong spines at the apex.

A. filamentosa. This grows to a medium size, has longish narrow leaves with a strong spine at the end, colour green, clothed with long filaments.

A. Ghiesbreghtii. A handsome kind, with dark green leaves, armed on the edges with formidable spines.

A. horrida. A very strong short-leaved species, green in colour, bearing immensely strong spines on the edge and apex.

A. Humboldtiana. A large-growing, stout-leaved species.

A. Jacquiniana. A large strong-growing species; leaves from 3 to 4 feet long, of a bluish green colour, spined on the edges and apex.

A. Kellockii. A stout-growing sort; leaves nearly 4 feet long, by 3 inches wide, glaucous, with a strong black spine at the extremities.

A. Kerchovei. A medium-growing kind; leaves pale green, still paler in the centre.

A. Leopoldii. A compact-habited plant, with short pale green leaves, spined on the edges and apex.

A. macrantha. A small-growing kind, with short glaucous leaves, spined on the edges.

A. picta. A slender-habited sort; leaves 3 feet long, by 2 or 3 inches wide, white on the edges, green in the middle.

A. rigida. A large-growing variety, with very long narrow leaves, deep green in colour.

A. Saundersii. A medium-growing kind; leaves stout and glaucous, armed on the edges and points with stout spines.

A. schidigera. A small-growing compact-habited kind; leaves 10 inches to a foot long, green banded with white, with white filaments.

A. Taylorii. A comparatively small grower; leaves a foot long, green in colour, strong spines at the apex.

A. univittata. A medium-growing kind, with moderately stout leaves, deep green, paler in the centre, armed with strong spines.

A. Verschaffeltii. A short thick-leaved species; leaves pale green, heavily spined on the edges and extremities.

A. yuccæfolia. Of moderate growth; leaves narrow, with small spines on the edges.

INSECTS.—Agaves are not much subject to the attacks of insects; if any affect them, sponging is the best remedy.

AGLAOMORPHA MEYENIANA.

The only known species included in the genus. A distinct-looking stove Fern from the Phillippine Islands.

For propagation and cultivation, see Ferns, general details of culture.

AKEBIA QUINATA.

A greenhouse evergreen climbing plant of comparatively little beauty. It may be increased by division of the roots in the same way as the stove climbers, Dioscoreas, to which it is nearly allied. The flowers are pinkish lilac, and appear early in spring. It comes from Chusan.

ALLAMANDA.

These are magnificent free-flowering stove plants, mostly natives of South America. Their large, trumpet-shaped, yellow blooms are produced in great profusion during a long period of the year, as when well managed they can be had in flower from April until late in the autumn. They are especially useful on account of the many ways they can be grown, succeeding well as trained pot specimens, and also as roof climbers, planted out or in pots. Their long uninterrupted habit of flowering renders them equally suitable for being grown in either way; the flowers are likewise well adapted for cutting, their colour harmonising agreeably with most other things. They increase readily from cuttings of the young half-ripened shoots, inserted in sand, with brisk heat, in a propagating frame or under a bell glass; they can be struck at any time of the year when cuttings can be obtained in the above condition, but about the beginning of March is the best, and then time is given for the young plants to make considerable progress before the autumn. Put the cuttings singly in small pots; they will root in a month, when they should gradually be inured to more air, and, as soon as they have got fairly established move them into 6-inch pots. Allamandas do best in good fibrous loam, to which add a moderate sprinkling of sand, and about one-sixth well-rotted manure; mix all together, using it, for the plants in this stage, moderately fine. Press the soil firm in the pots; now place them where they will get plenty of light, in a night temperature of 64° or 66°, with a rise of 10° or 15° during the day; pinch out the points of the shoots so as to induce the lower eyes to break, and give water all through the growing season before the soil gets so dry as to cause the young growth to flag. Admit a moderate amount of air in the middle of the day, and syringe every afternoon; but no shading is required, as all the species of Allamandas do better without it, making short-jointed stouter wood under the full influence of the sun, which, if the glass is of good quality, does not injure their leaves. Through the summer months the temperature may be 70° by night, and proportionately higher in the day. By the end of June the pots will be filled with roots, and they should be moved into others 3 inches larger. At this shift give ample drainage, using the soil in a more lumpy state, and breaking the fibrous, turfy parts into bits about the size of walnuts; again press it quite firm in the pots, as these plants will not do with it in a loose condition. Place four or five neat sticks in the pots, and to these train the shoots, the points of which again pinch out to get them to break. Continue the treatment as to heat, water, and syringing overhead until the middle of September, when discontinue the use of the syringe, admit more air, and do not give water to the roots until the plants flag considerably; this will check further growth, and help to harden up the wood. Keep on treating in this way till the end of October, allowing the soil to become a little drier each time before water is given so as to ripen the leaves; many of the earliest formed will now turn yellow, fall off, and little more growth will be made.

The temperature for the ensuing ten weeks may be reduced to 60° in the night, with 5° more by day; and only as much water should be given to the soil as will keep the green leaves towards the extremities of the shoots from shrivelling. Place the plants during this, their season of rest, at the coolest end of the house. About the middle of January remove all the green shoots, cutting back into the hard ripe wood, and turn them out of the pots. As little water has been given for some time back the soil will most likely be very dry, and, to ensure its now being thoroughly moistened, immerse the ball in a pail of tepid-water until the whole is wet through. If this is not done the new soil in which they are about to be potted will get saturated by the water required to moisten the ball through to the centre. After this is done return them to the pots in which they have been growing, and place them for a day in the stove to allow the water to drain off; then remove the old drainage and any loose soil that may be about the surface, and at once put them in their flowering pots, which may be from 15 in. to 18 in. diameter. Place in the bottom 2 in. of crocks to secure sufficient drainage, as they will need a deal of water. The soil should be similar to that already advised, but will be now all the better for

Allamanda Hendersoni.

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being a little more lumpy. Use the potting-lath freely, so as to ram it quite hard. These plants require the soil to be made as close as possible, more so than most others grown in pots. The best method of training Allamandas and other subjects of similar habit, when grown as pot specimens, is on a stout iron wire trellis, secured to three strong stakes inserted in the soil placed just within the rim of the pot. Such a trellis, 4 ft. high by 3 ft. in diameter, will be big enough for a large plant. As soon as the plants are potted, fasten the trellises in their places, and at once train the shoots to them, dispersing them evenly over about two-thirds of the lower part; if they are tied over the top they naturally push the young growths from that point, and afterwards, when being bent down to cover the trellis, they are very liable to break out.

The reason why Allamandas should be so far differently treated from most things, in being cut back and potted before they have made any growth, is that the young shoots are so brittle that in training them on the trellis they are likely to be broken off, and the plants are naturally such free growers that potting previous to growth being made does not interfere with their after progress. When the potting is completed, they should, instead of being plunged in a bed of tan or other fermenting material, at a considerable distance from the light, be elevated on inverted pots as near the glass as the trellis will admit of. So placed, the shoots will grow short-jointed and stout, the reverse of what they will be if stood further from the roof. Syringe overhead every afternoon. They will break into growth in about a fortnight, and as the young shoots advance keep them tied to the trellis in an upright position, as, if bent down before the bloom is well set, they may break back, the points generally ceasing to push much further; this causes delay in the time of their flowering. As the advancing shoots require more head room, the plants must be regularly lowered, so as just to keep the points from touching the glass. At the beginning of March raise the temperature 5° in the night, allowing it to run up considerably with sun-heat in the day. By the middle of the month, when the weather is very bright, it may be necessary to give for a short time in the middle of the day a little air by opening the ventilators about an inch or so; this will be enough, as if too much is admitted it will seriously affect the young tender growth.

It is at this season that careful attention is most essential, to anticipate the rise in temperature through the sun's influence in the fine weather by timely stopping the fires. It is an indication of the worst possible management in the cultivation of stove plants to be under the necessity, through the inconsiderate use of fire-heat, of admitting large volumes of cold external air in the spring to keep down the temperature sufficiently. If a little air is given, as above advised, when the thermometer rises to 80° in bright weather, no harm will be done by its going up 6° or 8° higher, if the atmosphere is kept moist, but the house must be closed sufficiently early and the fires set going, so as not to allow the heat to fall too low. As the soil becomes filled with roots the plants will require a copious supply of water and a free use of the syringe overhead. During April, if all has gone well, every shoot will have its point set with flowers; it is better to defer training until the bloom begins to open, after which the shoots ought to be carefully wound round the trellis, so as to distribute the flowering points evenly over it. They will now need water almost every day, and liquid manure two or three times a week; continue the use of the syringe, which will in no way injure the flowers. The night temperature may be kept at about 70°, with a rise of 10° or 15° in the day They will quickly push up another lot of shoots, which, when commencing to bloom, should be trained as were the preceding; they will thus keep on through the season. Give more air and less fire-heat as the summer advances. By July the plants may, if required, be removed to a warm conservatory and placed where they will not be under the influence of a draught of external air; here they will form conspicuous objects until the middle of August, when they should be returned to the stove, where they will, if wanted, continue to flower for some time. Afterwards they should be gradually ripened up, partially dried off as in the preceding autumn, and rested similarly. In January, as before, cut them back, and shake about half the soil from the ball, reducing a portion of the roots. Repot with new soil, and treat in every way through the season as advised previously. So managed the plants will last for many years.

Allamandas are amongst the best of stove-climbers, for which purpose they require to be treated as for trained plants, except that the trellis is dispensed with and the shoots are not stopped further than to induce their breaking, so as to furnish the allotted space; they should be freely cut back every season before they are started into growth. On account of their very strong habit of growth, even when required as climbers, it is better to grow them in pots than to plant out, unless they are wanted to cover a very large space, in which case they may be turned out in a border of limited extent, and the soil partially renewed each spring.

The following kinds are all well worth growing :—

A. carthartica. A well-known free-flowering kind, with moderate-sized blooms, which it produces plentifully.

A. Chelsoni. A profuse large-flowered kind, from Western Africa. It is almost as deep in colour as A. Aubletti, and has not the objectionable habit of the blooms reflexing natural to that variety, which it supersedes.

A. grandiflora. A magnificent sort, with beautiful bright canary-yellow flowers, produced in large quantities. It is very distinct in habit, and a much weaker grower than all the others, smaller foliage, and is most suitable for growing as a pot specimen, in which way it may with advantage be trained to sticks, trellis being dispensed with.

A. Hendersonii. A very strong-growing, large, free-blooming sort; the base of the flowers internally suffused with brown.

A. nobilis. A strong grower, with very large, finely-shaped, bright yellow flowers; requires a light situation to bloom freely.

A. Schottii. A very strong grower, with immensely large pale yellow flowers that reflex a good deal. It is not so free in blooming as the others.

A. violacea. A very distinct-looking species, with reddish flowers. It is not so handsome as the other kinds, but to those who like to grow plants of a decidedly distinct appearance it will be acceptable.

INSECTS.—Allamandas possess almost an immunity from insects, except from a minute yellow thrip, which is very troublesome if once it gets a footing, as it destroys and disfigures the young flower buds and leaves. It is best kept under by copious and daily syringing, as it is most difficult to kill by fumigation.

ALOCASIA.

Since fine-leaved plants have become fashionable, there has been a large addition to the number of cultivated species of Alocasia, and amongst them may be numbered many of the finest and most distinct of all stove subjects grown for the beauty of their foliage. Few families of plants present so much diversity in the form and colour of their leaves as do these Alocasias, from the bold and distinct combination of pale green and milky white in the stately A. macrorhiza variegata, to the shining metallic hue possessed to such a marked extent by A. metallica, both plants that, when they first appeared, made quite a sensation amongst cultivators. As decorative objects in the warm stove, they are unsurpassed, contrasting admirably with other fine-leaved as well as flowering plants. They are mostly found in the warmest parts of the world, where, in addition to a continuously high temperature, they are subjected to a humid atmosphere. Therefore, in order to grow them satisfactorily, they need both heat and moisture, otherwise they make little progress.

Alocasias are increased by means of suckers, which most of the species produce freely, and also by division of the creeping underground stems, as well as by small tubers that several of the species annually form. Propagation is best effected in spring towards the beginning of March, about which time the old specimens require a shift; all the species, except A. macrorhiza and its variegated form, we have found to do best in a mixture of sphagnum and the best fibrous matter out of very light peat (such as that used for Orchids), to which some sand, crocks, and dry shaly manure have been added, as, if anything at all close and adhesive is used, many of the kinds will make little or no progress. The small tubers formed by sorts like A. Veitchii do best put in shallow pans in a mixture similar to that just described until they have made a couple of leaves each, when they may be moved into little pots singly. Suckers, when taken off, should be at once transferred to pots proportionate to their size. An extra amount of drainage is required on account of their needing to be liberally supplied with water during the growing season, and also from the fact that most of the species are surface rooters, not pushing their roots down to any considerable depth in the pots.

Alocasias require a brisk heat in order to grow them well; in fact, most of the species will never attain anything like their proper size and appearance without the full amount of heat needed by the greatest heat-requiring plants. After the crowns are potted they should be kept in a temperature of nearly 70° at night, with a rise in the day proportionate to the state of the weather; a little air should be given during the middle of the day when the weather is such as to allow this to be done, but early in spring the admission of cold air, so as to come in contact with the plants, must be avoided. Shade at all times when the sun is bright, but let the plants be kept well up to the light. By midsummer larger pots will most likely be wanted, as most of the kinds are free-rooters, but with such species as A. Veitchii care must be taken that too much pot room is not given. Syringe overhead freely once a day through the growing season, getting the water well to the back as well as the front of the leaves; if this is not done, red spider will most likely attack them. Through the summer months the temperature may vary from 70° to a little over at night, and from 80° to 85° in the daytime, giving water so as to keep the soil always moist. Reduce the heat and atmospheric moisture as autumn sets in, dispense with shading as soon as the sun's power declines enough to allow this to be done, and syringe overhead seldomer.

In winter the temperature should be about 65° at night, with a proportionate rise by day. Nothing further is required except pot-room according to the size to which the specimens are wanted to grow. Such sorts as A. metallica may be grown to 6 feet or 7 feet through if desired, and weaker growers in proportion, but for general purposes smaller examples will be more useful. Each spring the plants should be turned out of their pots, and all the old soil removed, and replaced with new material. This is necessary, as, if an attempt is made to keep them a second year in the same soil, that will, most likely, before the end of the season, get decomposed and too pasty, conditions under which the roots are sure to perish. A. macrorhiza variegata does best in good fibrous loam, made very rich by the addition of one-third dry shaly manure, like that obtainable round the outside of an old hotbed, with sand sufficient to keep it sweet. This plant should be grown annually from a single sucker of the previous year's propagation, which, if well managed, will attain a size of 7 feet or 8 feet in diameter, and in this state, with its beautifully variegated leaves, it is one of the most effective of all variegated plants.

The best kinds are :—

A. Chelsoni. A hybrid raised between A. metallica and A. longiloba. It produces large leaves, shining green on the upper surface, purple beneath.

A. illustris. An Indian kind, not unlike A. Jenningsii, but a stronger grower; its leaves, like that kind, are green, mottled with blackish olive.

A. intermedia. This variety was raised by crossing A. longiloba with A. Veitchii. It has much of the beautiful greyish metallic shade of A. Veitchii, but grows a good deal larger.

A. Jenningsii. A handsome small-growing species from India, with leaves 8 inches or 9 inches long, of a rich green colour, and blotched with black or dark brown between the veins.

A. Johnstonii. A singular species, with spiny leaf-stalks and arrow-shaped leaves, green, veined with red. A native of the Solomon Islands.

A. Lowii. Similar to A. Veitchii in form of leaf, but the upper surface is much greener, and barred with metallic tints; it is likewise a much better grower than Veitchii. A native of Borneo.

A. macrorhiza variegata. A beautiful, large-growing species, with cordate leaves, pale green, with large white blotches, which sometimes cover half the surface. Ceylon.

A. Marshallii. An Indian species in the way of A. Jenningsii, but with a broad silvery band down the centre of the leaves.

A. metallica. A Bornean sort, with large, shield-shaped, metallic-tinted leaves, and one which may be grown to a large size.

A. Roezlii costata. A medium-growing, green-leaved species, blotched with silvery grey. From the United States of Colombia.

A. Sedenii. A hybrid raised between A. Lowi and A. metallica; in form most like the first-named parent. A handsome plant.

A. Thibautiana. A Bornean species something in the way of A. Lowii, but larger. Blackish green in colour, with distinct white veins.

A. Veitchii. A very handsome species, also from Borneo, having long arrow-shaped foliage, with ivory-white midribs, and a bluish slate-like colour on the upper surface of the leaves, which are deep purple beneath.

A. zebrina. A strong-growing species with large sagittate leaves, green in colour, stalks banded with blackish green, which gives the plant a handsome appearance. Philippine Islands.

INSECTS.—The regular syringing required for these Alocasias through the growing season will keep down the smaller insects that attack them, such as aphides, thrips, or red spider; should mealy bug by chance effect a lodgment on the back of the foliage or leaf-stalks, it must be removed by sponging.

ALOE.

These are greenhouse succulent plants, nearly all coming from the Cape of Good Hope. A few of them are worth growing for their handsome leaves, in addition to their somewhat singular flowers.

They are propagated from suckers taken off the old plants in spring, inserted in small pots, and placed where they will get a little extra warmth. Ordinary loam with a liberal addition of sand and small pot shreds suits them, and they should be given more root-room as they increase in size. They require little water in winter, but should have the soil kept moderately moist during the growing season

The following are the most distinct :—

A. abyssinica. A stout-growing species, with thick, fleshy leaves, long and broad; green, spined on the edges. From Abyssinia.

A. Soccotriana. A branching plant, with upright habit; leaves green, spined on the edges.

A. variegata. The well-known partridge-breasted Aloe. A pretty window plant, thriving where many things would not grow. Leaves stout, six to eight inches long; green, banded with grey.

INSECTS.—The nature of these plants is such that few insects affect them; greenfly is sometimes troublesome on the young flower-spikes; fumigation is the best remedy.

ALOYSIA CITRIODORA.

This, which is a deciduous greenhouse plant, is synonymous with Verbena triphylla, or the Lemon-scented Verbena as it is often called. It is a native of Chili, and has insignificant flowers. Its pale-green lanceolate leaves are highly fragrant, and for them the plant is cultivated, and is a general favourite.

It strikes freely from cuttings, inserted in sand in the spring, covered with a bell glass, kept moist and shaded in a moderate heat; thus treated they will root in a few weeks, when they must be moved singly to small pots, in sandy loam. As soon as growth has fairly commenced stop the points to cause the formation of side shoots; this operation should be repeated two or three times to secure a bushy condition of the plants. Give larger pots when required; 5 or 6 inches in diameter will be big enough for the first year. After they are fairly established greenhouse treatment is all they need, such for instance as Fuchsias succeed with as to air warmth and moisture. In the winter they should be kept drier, and may with advantage have their shoots shortened back before they start into growth in the spring, removing part of the old soil and giving pots two or three sizes larger; afterwards treat as in the preceding summer.

The plants may be kept for a number of years by giving increased root-room, previously cutting in the branches moderately; in this way their deliciously-scented shoots will admit of being used freely for mixing with cut flowers.

INSECTS.—The plant is liable to the attacks of most insects that feed on greenhouse plants generally; for aphides and thrips fumigate, syringe and sponge to get rid of scale.

ALSOPHILA.

This genus of Ferns contains stove as well as greenhouse species. The cooler kinds are the most deserving of notice, but neither are equal from a gardening point of view to the Cyatheas and Dicksonias.

For propagation and cultivation, see Ferns, general details of culture.

STOVE SPECIES.

A. contaminans. Philippine Islands.
A. lunulata. Polynesia.
A. Rebeccæ. Queensland.

GREENHOUSE SPECIES.

A. australis. Australia.
A. Beyrichiana.
A. excelsa. Norfolk Island
A. Leichardtiana. New South Wales.

AMARYLLIS.

These are stove bulbous plants, many of which are evergreen, while others shed their leaves in winter, the principle difference in their culture being that the evergreen kinds, although requiring to be kept much drier at the roots when not growing during the winter season must not be allowed ever to become quite dry—a condition necessary with such as are deciduous. Of the first species introduced, a few are from the Cape of Good Hope and the West Indies, but the greater number are indigenous to Brazil and the adjacent countries. From these have sprung the present race of splendid hybrids, possessing a free habit of blooming, and producing large and truly gorgeous flowers, wherein the stripping and blending of soft and intensely deep colours are combined in a way that is not surpassed by any plants in cultivation. They possess the double merits of being easily grown and not getting too big for those who have not the convenience of large stoves. They succeed well in good fibrous loam of a strong nature, with just as much sand added as will ensure its not getting sour and impervious to the plentiful supply of water they require when growing.

There is one thing in their management that those who essay their culture will do well to bear in mind—that they do not, especially the evergreen kinds, like their roots disturbed. Disturbance is the less necessary, as they do not need a great deal of pot-room, and always do the best when the roots have well filled the soil; at the same time this must not be carried too far by allowing them to starve for want of sufficient root space, or the flowers they produce will not be so numerous or so fine, nor will the plants increase as they ought to do by throwing off offsets. They can be raised from seed, and those who take an interest in hybridising have an ample field before them in raising new varieties by crossing.

When the seeds are ripe they should be sown in well-drained pans filled with good yellow loam, to which has been added as much sand as will keep the soil in a condition that the water can pass through it. Cover the seeds slightly, and place the pans in an intermediate temperature of 60° in the night, and proportionately higher in the daytime; give as much water as will keep the soil moist. When the young plants make their appearance allow them plenty of light; as the days lengthen, give 5° more heat in the night and 10° or 15° in the day; let them have enough water, and admit air, as they will not make satisfactory progress if too much confined. It is not well to disturb them from the seed pans until they have made several leaves and the bulbs have begun to form, which condition they will be in towards the close of summer if all has gone well with them. They should then be placed singly in small pots, well drained, and the soil pressed quite solid about the roots. They generally succeed better when the greater portion of the bulb is covered in the soil than when potted higher above it. This applies to all their stages of growth. At once return them to the coolest end of the stove, and as the object is to keep them in growth summer and winter for a couple of years, so as to save time, the temperature may now be kept from 55° to 60° in the night and a little more in the day; they should be attended to regularly with water. As solar heat increases, raise the temperature proportionately, and as soon as the soil is well filled with roots, shift them into 4-inch or 5-inch pots, draining sufficiently and making the soil quite solid, as in the first potting. Grow them on without delay by constant heat and moisture, and plenty of light all through the summer and autumn; winter in a similar temperature to last year; in the spring move them into 6-inch pots, and treat in every way as in the past summer. In the autumn place them where they will be under the ripening influence of all the sun and air possible, and gradually withhold water; through the winter stand them on an airy shelf in a temperature of from 46° to 50°, with just enough water to prevent the leaves flagging; and in the spring again give more heat and moisture. If the bulbs have attained the strength that they should have from the treatment prescribed, most of them will flower; after which give such as appear to require it pots an inch larger, and place them through the summer under similar conditions to promote growth as hitherto advised. In the autumn and winter repeat the ripening and resting process, but never attempt to keep them too cool in the winter—through this cause innumerable quantities of these fine plants have been lost. In their native country the only change they are subject to is from hot and damp in their growing season, to dry during the period of rest, consequently they will not bear to be kept too cold in the winter. For a time they will stand a lower temperature than that above given for their season of rest, but there is always danger of their decaying when so treated, and it also impairs their strength. In succeeding summers give small shifts when it is evident that they need more room, but not otherwise; as they get strong they will push offsets that can be taken off and grown on singly, managed as advised for the plants raised from seed. The above treatment of course applies to seedlings that have been raised from evergreen kinds, and are similar in habit to the parents. To such as are deciduous, no water must be given from the time that the growth is fully matured and ripened up in the autumn until they are to be started in spring; in other respects the treatment required is the same. Both the evergreen and deciduous kinds want a plentiful supply of water whilst they are making growth; any stint at this stage will be sure to impair their strength and inflict serious injury. They will also be benefited at this time by a frequent supply of manure-water not too strong. This splendid genus of plants has within the last few years received from many plant-growers the attention it deserves, and has emerged from a state of comparative neglect, to which it seems unaccountable it should ever have been consigned; yet that it was so neglected is undoubtedly the case, for there is ample evidence to prove that Amaryllises were much more generally grown half a century since than they are at present.

A. Ackermannii. An old but fine kind, with deep crimson flowers. Many of the new hybrids owe their parentage to this good old species. It comes from Brazil.

A. Ackermannii pulcherrima. A very fine sort, with large flowers of an intense crimson colour. One} of the best in cultivation.

A. kermesina. Carmine. From Brazil.

A. Leopoldii. Base of all the segments reddish-crimson, extremities ivory-white, immense flowers, and fine in every way. Peru.

A. longiflora. Flowers large, long in the tube, pale ground colour suffused with rose, centre white. A native of Costa Rica.

A. pardinum. A most distinct sort that bears immense flowers, which open quite flat, showing all the inner surface; ground colour creamy-white, profusely covered with crimson spots. From Peru.

A. pyrochroma. Vermillion red. Brazil.

In addition to the species of Amaryllis, described above, the following hybrids are beautiful kinds, and from a cultural point of view they surpass the species:—

A. Brilliant. A bold flower with broad petals, crimson-scarlet, profusely spotted.

A. Chelsonii. A large flower with broad segments, the lower part of which are crimson, the extremities creamy-white. A most remarkable kind.

A. Crimson Banner. A fine-shaped flower, deep crimson in colour.

A. Dr. Masters. Flowers of moderate size, well-formed; colour, scarlet shaded with crimson. One of the best varieties.

A. Exquisite. Flowers large, petals stout, scarlet in colour, with a white central stripe to each. A very free-flowering sort.

A. International. Flowers moderate in size, fine in shape, colour crimson-maroon with white veins. A fine variety.

A. King Arthur. Medium-sized flowers; ivory-white ground colour, spotted and streaked in the centre with crimson.

A. Mooreana. A handsome-shaped flower, of good substance; colour deep red.

A. Mrs. Baker. Flowers large and fine in form, segments broad; colour glowing scarlet shaded with crimson, centre striped with white. One of the finest varieties ever raised.

A. Mrs. Burroughs. Moderate-sized flowers, petals reflexed, colour scarlet, shaded with crimson, and edged with white.

A. Mrs. Rawson. Bright crimson in colour, the segments edged with white.

A. Princess Augusta Victoria. Flowers large, ivory-white, streaked with crimson.

A. Storr's Beauty. Small, beautifully-shaped flowers, scarlet, with white stripe at the base in the middle of each petal.

A. Thomas Speed. A strong grower, unusually profuse in flowering, medium in size; colour scarlet, white centre.

INSECTS.—Aphides often attack the young leaves and unexpanded flowers, and can be destroyed by fumigating with tobacco, or by sponging; the form of the leaves is such as to favour their being thus easily removed. Thrips and red spider will sometimes make their appearance if syringing is not resorted to ocasionally; to destroy these lay the plants on their sides and syringe freely with clean water. Scale and mealy bug will also live upon them, and the best remedy is sponging, getting down to the base of the leaves, where the insects harbour.

AMHERSTIA NOBILIS.

One of the most gorgeous of all flowering trees. An evergreen stove species from the hot regions of Eastern India. From the dimensions it attains it requires a good-sized house almost to itself; this no doubt is the cause why it is so rarely met with.

It can be raised from seeds, or from shoot cuttings of the half-ripened wood, which will be found in condition in summer. These should be put singly in pots filled with sand, kept close and moist, and shaded in a temperature of 75°, or a few degrees more. When they are rooted gradually remove the glasses so as to inure them to the atmosphere of the house, giving air and shade when needful. As soon as enough roots are formed move into pots a couple of sizes larger; good loam is the most suitable soil. Continue to keep up a comparatively high temperature through the autumn and winter, as the plant will bear as much heat as almost any in cultivation. In spring give pots two or three sizes larger, using soil such as before; increase the temperature as the days get warmer: 75° in the night in summer, and 85° to 90° by day, with sun-heat, will answer. Use a thin shade in bright weather; admit air for a time daily; syringe freely overhead when the house is closed, and give plenty of moisture at all times through the season of growth. Give more air towards autumn, with less atmospheric moisture, and winter as before. Larger pots will be needed in spring, the size being regulated by the condition and quantity of roots present; treat onwards through the season as previously. By the spring following the plants should be large enough to plant out. A good bed ought to be prepared by putting the necessary drainage in the bottom, and filling in with good loam, to which add some sand and a moderate sprinkling of broken crocks, or other material of a like nature, as the soil in all cases such as this, where confined under glass in a close atmosphere and subjected to continual watering by the use of the syringe, is liable to get sour and adhesive. If the plant is well managed, and has room enough given it, it will live for many years, producing annually its long racemes of bright red, yellow spotted flowers.

INSECTS. — The constant use of the syringe, already advised, through the growing season will keep down the less objectionable insects, but scale and mealy bug can only be destroyed by repeated sponging, which must be done as often as found necessary.

AMORPHOPHALLUS.

These are singular stove Aroids, with ample handsome foliage. The flowers are more curious than beautiful. They require similar treatment to Caladiums, which see.

The following are distinct kinds :—

A. bulbiferus. Flowers red, produced in spring. A native of East India.

A. campanulatus. Has purple flowers, and is a spring bloomer. From Ceylon.

B. cupreus. A distinct-looking species, with attractive flowers.

A. giganteus. A strong grower, with purple flowers. A native of India.

ANANASSA SATIVA VARIEGATA.

(The variegated Pine Apple.)

This handsome stove plant is a favourite with cultivators. It differs in no way in appearance from the ordinary forms of the fruit-bearing Pines, except that the leaves are handsomely variegated.

It is increased by suckers in the same way as others of the genus. After removal from the parent plant, they should be laid for a couple of days or so in the stove, so as to allow the base to dry up a little ; then strip off a few of the lower leaves. They may then either be inserted in a bed in the stove (if such exists) until rooted, and afterwards put in pots proportionate in size to that of the now rooted suckers, or they may be put singly in pots, filled with good turfy loam, to which has been added a little sand, the soil being kept drier than requisite for most plants. If they can be accommodated with a brisk bottom heat they will root more quickly, although this is not indispensable. After they are well-rooted, the plants should be elevated near the glass, and given air daily in the growing season, with a slight dash of the syringe in the afternoons. No more shade should be used than the construction of the house and its position necessitates, as the more light the plants receive the stouter and more beautifully arched in form the leaves will get. The suckers may be taken off and struck any time in the spring or summer, when large enough, but it is well not to separate them from the plants that produce them until they have attained considerable strength, otherwise they take longer to grow up to a handsome size. Ordinary warm stove treatment summer and winter answers for them. All that is further required is to give more pot room as it is wanted : a 12-inch pot is big enough to grow a large example in. It is a plant that at all times requires careful watering, but water should not be applied until the soil is drier than most things require it to be.

There is another variety, A. Porteana, somewhat different from the preceding in its variegation ; it will succeed with like treatment to A. sativa variegata.

INSECTS.—Like other kinds of Pine Apple, the variegated varieties are not much subject to the attacks of insects, but mealy bug and white scale will live on them. Care should be taken never to begin with plants affected with the latter insect, which is difficult to get rid of, getting, as it does, down to the base of the leaves ; if mealy bug attack the plants, sponging will be the safest remedy.

ANCYLOGYNE LONGIFLORA.

An evergreen stove plant of shrubby habit, with large leaves, and tubular purple flowers, produced in drooping panicles. It is an effective plant, and can, by liberal treatment, be grown to a large size, like many other quick-growing Acanthads, in little time, or it may be flowered in a small state.

The treatment it requires is such as advised for Justicias, which see. It comes from Guayaquil.

ANEMIA.

A genus of stove Ferns, with a decidedly distinct habit. The fructification is produced in the form of a panicle, similar to that of the well-known British Fern, Osmunda regalis.

For propagation and cultivation, see Ferns, general details of culture.

A. collina. Brazil.

A. flexuosa. South America.

A. tomentosa.

ANGIOPTERIS EVECTA.

A very distinct-looking and handsome stove species of the genus Angiopteris, which should be grown by all who form collections of Ferns. It comes from the Society Islands. For propagation and cultivation, see Ferns, general details of culture.

ANŒCTOCHILUS.

Although Anœctochili attain a height of only a few inches, and in this respect are insignificant, compared with many of the noble stove fine-foliaged plants now in cultivation, they may nevertheless be justly termed the gems of the vegetable kingdom, so exquisite is the network of veins which covers their leaves. Anœctochili are found in both the Eastern and Western hemispheres, but the kinds which possess the richest leaf-colouring come from the East, the silvery-veined sorts in most cases belonging to the West. Unfortunately they are generally found difficult to cultivate; though they can often be increased and made to grow well for a time, it not unfrequently happens that they sicken and die off, even in the hands of those who have been most successful with them, and this without any change in their treatment or remission of attention; these facts point to something wrong as regards management. The flowers that Anœctochili produce are insignificant, and on that account no one cares about them. Therefore, in place of subjecting the plants to alternate periods of growth and rest, as in the case of other Orchids appreciated for their bloom, they are generally pushed on to make growth so as to increase their numbers as quickly as possible. For a good many years we grew all the best varieties in a house that could not be kept higher than 60° at night during winter, and from a small stock soon had pans of setaceus, Lowii, xanthophyllus and others, 16 inches across, filled as full as they could hold with plants unusually strong; but as soon as we gave them more warmth in winter, and consequently less rest, they failed to do so well.

They are increased by cuttings made from their fleshy stems, which should be cut into pieces consisting of one or two joints each. Divide the pieces midway between the joints—not at the joint, as in the case of most other plants. They may be propagated at any time during spring or summer, but propagation is best carried out before growth commences, about the end of February. Sphagnum chopped fine, three parts to one of fibrous matter from good Orchid peat, with some sand and small crocks or charcoal, is the best material in which to grow them. 3-inch pots, well drained, and filled with this compost, will hold two or three cuttings, the roots of which, if there be any, should be inserted in the soil, and the pieces pegged down horizontally, so as to almost imbed them in the compost, which ought to be pressed moderately firm and kept slightly moist, but not too wet. The little pots should be plunged in a larger pot or pan in a mixture of sphagnum and sand, and the whole covered with a bell-glass, which should be kept tilted half an inch or so to admit some air. They should be placed where there is plenty of light, but shaded from sunshine if it be at all powerful. A night temperature of 60°, with an increase of 10° in the daytime, will be sufficient until the sun gets a little more power. In a few weeks the buds will start, and soon form shoots and small leaves; give water so as to keep the soil in a slightly moist condition, and in May increase the temperature at night to 65° or 60°, letting it run up to 80° or 85° in the daytime. It is a good plan to wipe the moisture from the inside of the glasses daily, as its removal lets in more light, an important matter as regards giving strength and solidity to the young growth; for although Anœctochili will grow fast in a semi-darkened place, the growth thus made is weak. A position close to the upright glass, either at the front or end of the house in which they are grown, is best calculated to keep them healthy, but they must not have a current of cold air admitted near them, such as would enter if a light opposite to where they are placed were opened. The length of time it takes to produce full-sized crowns from cuttings like those described depends upon the strength of the plants from which the cuttings are made; if the stems are thick, the young plants will make four or five leaves before autumn.

The summer treatment is simply a continuance of that just recorded. When in full growth they should, however, have more water, but they should never be allowed to get either too dry or too wet. In giving water, if any rest on the young unfolded leaves, it is well to blow it off. After the middle of September shade only when the sun is very bright. In the last two months of the year and two first of the ensuing one 60° at night will be sufficient, allowing 6° or 8° more by day. When possessed of a fair amount of stock, instead of cutting the plants up into pieces, as has just been recommended, be content with severing a joint or two from the base in the spring just before growth commences, at the same time removing the plants into fresh material if the old seems getting too much decomposed. In this way large pots of handsome full-sized crowns can always be had, and the stock increased as well. Whenever they show signs of flowering, cut the bloom-spikes out as soon as they can be got at, as removing them strengthens the plants.

The following are some of the most handsome and distinct kinds :—

A. argenteus. Very distinct from the golden-nerved kinds. It has pale green leaves, netted with silver veins, glistening like frozen dew. Brazil.

A. argenteus pictus. Like A. argenteus, with the addition of a pale silvery band down the middle of the leaves. Brazil.

A. Dawsonianus. A strong, erect-growing plant, with very dark leaves. Distinct in habit. Malacca.

A. imperialis (syn. : A. petola). A very fine kind, the leaves of which are pale olive-green, with light-coloured veins. Java.

A. intermedius. A strong-growing kind with handsomely marked foliage, not quite so bright in the veins as A. setaceus. Java.

A. Lobbii. A scarce sort, that forms large leaves of a deep ground colour, charmingly relieved with light veins. Java.

A. Lowii. A large-growing distinct species, and very handsome. It forms very large, broad, velvety leaves of almost a black-green colour, beautifully relieved by light-green veins. A slow grower. Borneo.

A. Lowii virescens. A distinct form, with paler coloured leaves. Very beautiful. Borneo.

A. setaceus. A free-growing species, with dark reddish-brown velvety leaves covered with a network of transparent golden veins. Ceylon.

A. setaceus cordatus. A form of the above with deeper coloured veins. Java.

A. xanthophyllus. A very distinct and handsome sort, which, in addition to the veining, has a broad band of lighter colour running down the middle of the leaves. Ceylon.

INSECTS.—Greenfly sometimes affect Anœctochilus, getting on the under sides of the leaves. Immediately their presence is detected fumigate with tobacco, repeating the application until all are destroyed.

ANOPTERUS GLANDULOSUS.

A large-growing evergreen shrub, with handsome leaves, suitable for a roomy house, for which alone it is adapted.

It can be increased and grown in the way advised for Clethras, which see. There is only this species in cultivation ; it bears white flowers, which appear in winter, or early spring. A native of Van Dieman's Land.

ANTHURIUM.

(Flowering.)

Of these there are several that will bear a favourable comparison in their flowers with the best plants brought into the country in either recent or bygone times. There are some that especially deserve a place in even the most select collection of blooming stove plants ; but as they require somewhat different usage as to soil, it will be necessary to treat of them separately.

Amongst the more recent introductions of Anthurium, is the white-spathed A. candidum, from the United States of Colombia, a plant of somewhat slender habit, with rather small, erect, ovate, lanceolate leaves, on proportionate foot stalks ; the spathes are about 3¼ inches in length. It associates well with A. floribundum, a new Grenada species, which has much broader, slightly lanceolate leaves, dark-green, and of compact habit ; the spathes of this plant are also white, and it lasts long in flower. Both may be increased by division of the crowns taken off in the spring, when they have made a few roots from the base. That these exist before the crowns are separated from the parent plant is essential, as, if taken off before they have formed roots independent of the plant that has produced them, they will be long in growing away freely. When taken off, place them in pots just large enough to permit of the roots being inserted without injury. They are surface rooters, requiring an abundance of water, consequently they do not need a great depth of soil, but must have plenty of drainage material. Half fill the pots with crocks ; the soil should consist of fibrous peat three parts, to one of flaky rotten dung that has been well dried. Such as has lain exposed on the surface for mulching a Vine border or an Asparagus bed is in the best possible condition for the roots of these Anthuriums ; add to these a fifth part of leaf-mould, a good sprinkling of crocks broken the size of horse beans, and a fair quantity of silver sand, mixing the whole well together. Do not, even whilst the plants are small, sift the soil, but pull it to pieces with the hand; press moderately firm, and pot the crowns an inch or so down, just covering the roots a little; put a small stick to each for support, give water, and place them in a brisk heat of 65° in the night, with an increase during the day. Keep them a little close until they begin to grow, but not so much confined as would be requisite in the case of ordinary cuttings. Raise the temperature both day and night as the season advances, giving air in the daytime when the weather is such as to require it, and shading slightly when the sun is upon them. When a fair amount of roots have been formed, the plants should be moved into pots two inches larger, using similar soil to that in which they were before placed. Continue to treat through the summer as already advised, syringing them freely every afternoon, and also giving plenty of water to the roots. Reduce the temperature, and discontinue shading as the weather gets cooler, keeping them through the winter in a temperature of 55° in the night; but do not let the soil get dry. Repot in April, giving two or three inches of a shift, still half-filling the pots with drainage, and using the soil in a more lumpy state as the plants get larger; this season they will push up flowers from all the strongest leaves, but it will not be advisable, even whilst in bloom, to move them out of the stove, as a lower and drier atmosphere would interfere with their growth. Continue the summer and winter treatment in this and subsequent years as already recommended, giving more pot room when it is wanted. They will go on for years increasing in size as long as required, and, when they get larger than desirable, they may be reduced by division of the crowns. These Anthuriums can be increased from pieces of their rhizome-like stems cut in bits an inch or two in length, inserted in soil such as that advised for potting the crowns in, and treated similarly afterwards. They can also be grown from seeds managed as hereafter detailed for the propagation of A. Scherzerianum and its white variety by this method.

A. Scherzerianum is now well known, and is undoubtedly one of the very finest and most distinct flowering plants ever introduced to this country. By judicious treatment in recent years it has been grown to a size, of both leaf and flower, such as was never anticipated from the small examples produced when first bloomed after its introduction. It is from Costa Rica, and can be readily increased from seeds. For a considerable time after it was brought to the country few persons succeeded in seeding it, simply because they did not allow time for the seeds to get matured; they are borne on the outside of the spadix, in compressed globular, pulpy masses, about the size, and when ripe of the colour, of pale red currants. To produce good seed, flowers should be selected that open towards the close of summer; about August, when the spathes decay, they may be cut off, leaving the twisted spadix growing upon the peduncles. These will remain through the winter in much the same condition as they appear in the autumn, quite brown, with little apparent vitality in them, but in the spring the spadix will entirely, or partially, untwist, and the seed vessels will begin to swell, being at first of a green colour, afterwards becoming orange-red as they ripen. When fit to gather they are almost transparent, and will part readily from the spadix. They should then be removed, washed out of the pulp in the way usual with melon or cucumber seeds, and at once sown. Procure large-sized seed pans, in which place an inch of drainage; then get some clean sphagnum moss, free from grass or weeds. Chop this quite fine with a pair of scissors or hedge shears, and add to it one-fifth of clean sand and some crocks or charcoal, broken about the size of small peas. Fill up the pans with this mixture, pressing it firmly down, and water the surface, sprinkling a little more sand if that which has been already mixed with the moss is washed down; damp the surface again, and sow the seeds thickly and evenly over it, pressing them gently down with the hand, but not covering them in the least. Put a propagating glass over the whole to keep in the moisture, as this will prevent the necessity for giving much water; if this is given in considerable quantities, it has a tendency to wash the seeds overhead into the material, which must not occur, as they vegetate much the best when on the surface. Keep the whole quite moist; it must never be allowed to become dry, but, when water is given, let it be applied with a fine rose, so as not to disturb the seeds at all. Place in a night temperature of 65°, and 10° more in the day; in a few weeks they will begin to grow.

Let the young plants, from the time they first vegetate, have plenty of light, but do not allow the sun, when at all powerful, to come upon them without shading: give air in the middle of the day, and syringe overhead in the afternoons.

By the beginning of September they will be large enough to prick out, several

ANTHURIUM SCHERZERIANUM. *To face page 42.*

together, into 3-inch pots, half-filled with drainage. Material similar to that in which the seeds were sown should be used. Keep the soil well moistened, for this Anthurium is a swamp plant, and cannot endure to be dry at the roots. Keep through the winter in a temperature of 55° or 60°, and a few degrees warmer in the day. This is considerably hotter than is requisite for them when they get larger; but the object now is to push them on without loss of time. About the beginning of March move singly to small pots, in material such as used before, with a little fibrous peat added; through the spring and summer keep at about 60° or 65° by night, with a proportionate rise in the day. Treat as to moisture, light, air, and shade as advised for last summer. By the end of June give 4 or 5 inch pots, according to the size they have attained; the soil they now require is one-half the best fibrous peat to about an equal quantity of chopped sphagnum, with a liberal addition of sand and broken crocks or charcoal, half-filling the pots with drainage. Treat as hitherto recommended up to the end of September, wintering as before. Again pot them in the spring, giving pots 2 or 3 inches larger. This summer they may be allowed to open a few flowers. Most of the plants will differ more or less in the size, shape, and depth of colour in the blooms. Remove them before they form seeds, as the progress of the plants will be stopped if they are allowed to do so. Those that have the largest and best formed flowers should be marked, and have special encouragement. As they grow up into a useful decorative size they may be kept at a temperature of 50° in the night during the winter, and should not receive so much water, but still enough to keep them growing. They will make the strongest leaves in the winter; through the spring and summer let the temperature be 10° or 15° higher in the night, and proportionately more in the day. They will go on making larger leaves and flowers until they get five or six years old, as well as forming numbers of crowns, increasing the bulk of the plants for an indefinite time, provided the soil is never allowed to become sour and adhesive—in which case the roots are sure to perish. To avoid this, each year when repotting get as much of the old exhausted material away as can be done without injuring the roots. From the time the plants have got to a useful flowering size, the best time to repot is in the summer, after the principal blooming is over; when this is will depend upon the temperature they are kept in during the early spring, as the warmer they are the earlier they throw up the main lot of flowers.

The white form of A. Scherzerianum requires treating in every way like the red variety. Both can be increased by division of the crowns, and by pieces of the rhizome in the manner described for A. candidum and A. floribundum.

A. Andræanum. This is a most beautiful species, quite distinct from all others. The spathes are large, heart-shaped, corrugated on the surface like the cartilage of the human ear, bright scarlet in colour, and shining as if newly varnished. The lower portion of the spadix is white, towards the extremity yellow; it droops in front of the spathe, and by the contrast in colour seems to intensify the brightness of the latter. It is one of the most remarkable and beautiful plants that has appeared in recent years. It will require keeping somewhat warmer than A. Scherzerianum. From Colombia.

A. ornatum. Has medium-sized leaves. The spathes are 6 inches long, white in colour: spadix purple. A native of Venezuela.

A. Scherzerianum Wardii. Is a very distinct and desirable form of the red species, with immensely broad spathes, which are bright scarlet in colour.

INSECTS.—Thrips and greenfly are both partial to the leaves and flowers; but the continuous syringing advised is generally sufficient to keep them in check, otherwise they may be killed by fumigation. Brown scale thrives upon the leaves, and must be kept under by sponging; so may mealy bug, should they become affected with it.

ANTHURIUM.

(Ornamental leaved.)

Amongst Anthuriums there are many very handsome and distinct plants hardly surpassed by any of the fine-leaved stove subjects now so much cultivated. Numbers of the species are of an evergreen herbaceous habit, producing large handsome foliage of a beautiful velvety texture; they are mostly from warm countries, and need a good amount of heat in which to grow satisfactorily. They are increased by division of the crowns and by suckers, which most of the species when strong produce more or less freely. They may be divided, or suckers may be taken off, at any time during spring or summer, when growth is active, but spring is preferable, just as growth is about to commence. It is not well to remove the suckers until they have made some roots, or a portion of their leaves will be liable to go off before they get established, but when they have formed a few roots and pushed down into the soil, the suckers can, as a rule, be cut off and the roots be got with them entire; they should at once be put separately into small pots and kept a little, but not too close. They will usually be found to grow away without much check, and only need to have more pot-room given them as they increase in size. If wanted very large, good-sized pots will ultimately be required, as many of the species are strong growers. Their roots are much inclined to keep on the surface, and on this account the pots should be deeply drained, which is also necessary as they need water plentifully during the growing season. Good turfy peat with some sand and small crocks added is the best material to grow them in. They will thrive through the spring in a temperature of 60° to 65° by night, raising the heat during the day, and as the season gets further advanced 70° in the night and 80° or 85° in the day will not be too much when the weather is warm. Place them where they will get a fair amount of light, but shade must be applied when the sun is at all powerful. Give air on favourable occasions, and syringe overhead freely once a day whilst any growth is going on. A night temperature of 60° to 65°, with 10° more in the day, will be heat enough through the winter. The strongest-growing species can be grown to a large size if desired simply by not dividing them and by giving sufficient root space.

The undermentioned are all good kinds:

A. Brownii. A strong-growing species, with tall stems, bearing leaves 3 feet long, cordate-lanceolate in shape. Colombia.

A. crystallinum. This has very large beautiful massive leaves of a pale olive green, the midrib and principal nerves having a distinct white band running their whole length. It comes from New Grenada.

A. magnificum. A handsome species, with large leaves 2 feet across, deep green in colour, and of a silky appearance; the nerves are white. A native of Brazil.

A. Margaritaceum. This has neat foliage, but its principal attraction is the numerous clusters of lilac berries that it bears, and which are produced freely.

A. regale. A very stout-growing plant, with handsome large leaves. South America.

A. Veitchii. Has leaves from 2 feet to 3 feet long by 10 inches wide; colour, deep green with a metallic tint, the surface waved and very distinct in appearance. A native of Colombia.

A. Warocqueanum. Has leaves which are arrow-shaped and from 24 inches to 30 inches long, deep green and velvety in texture, the midrib and veins being almost white—a grand plant. From New Grenada.

INSECTS.—The leaves of these Anthuriums, being large and comparatively few in number, do not offer much shelter for insects, which are generally kept in check by the regular use of the syringe through the growing season. Should mealy bug or scale effect a lodgment, they must be sponged off carefully, so as not to bruise or injure the leaves.

ANTIGRAMMA BRAZILIENSE.

A stove species of Fern with well-marked character, distinct in appearance, and a desirable kind. From Brazil.

For propagation and cultivation, see Ferns, general details of culture.

APHELANDRA.

These splendid autumn and winter blooming plants rank amongst the finest ornaments of the stove, and are deserving of general cultivation; the fact that they come into flower when the greater number of the summer bloomers are on the wane makes them doubly acceptable. They possess the twofold merit of flowering as freely in a small state as they do when grown up to large specimens, and this gives them the advantage of being suitable for those who require plants for the decoration of large houses as well as for those of less pretensions. Another matter of importance is that their growth can be so regulated as to have them in flower over a lengthened period in succession; from early in September to considerably later on some of the varieties, especially the charming A. Roezlii, can be had in bloom up to late in the spring, when its bright orange scarlet-coloured spikes and ample shining leaves afford an admirable contrast to anything else. One of the finest of the genus is the well-known A. cristata, which was introduced from the West Indies, and which, when well managed, with its gorgeous crested spikes of orange scarlet flowers produced from the points of the shoots, is one of the most beautiful autumn ornaments of the warm conservatory. It succeeds in either peat or loam; in the former its ample stout leaves grow to a larger size and assume a deeper shade of green; in loam it makes shorter growth, and generally produces its flowers a little deeper in colour. After trying the plant in peat and also in loam, as well as in a mixture of equal parts of each, we have found that the last is preferable used in equal proportions; both should contain a fair amount of fibre and have added to them one-seventh of sand. Cuttings strike readily taken off with a heel, placed singly in 60-sized pots in a mixture of half-sifted peat and sand, with a little clean sand on the top; give a little water at the time they are inserted, and at once put them under a propagating glass in a temperature of 70°. If with bottom heat, 10° higher, they will root all the quicker; but where there is no convenience for giving bottom heat it may be dispensed with for this as for most other stove plants, provided that the temperature of the house can be kept up sufficiently. The cuttings should be put in as early in the season as they can be had in proper condition, which will be when the young growths are about three or four inches in length. This they will have attained by the middle of April, provided that the plants from which they are taken have been kept in a warm house through the winter. Keep the cuttings sufficiently close to prevent their flagging, but not so as to cause the leaves to damp—a condition they are likely to suffer from if a little air is not given. By the end of May enough roots will be formed to admit of the propagating glass being dispensed with. They should then be moved into 6-inch pots. For this first shift the soil should be sifted and used, as already advised, in equal proportions of loam and peat; the plants will grow quicker if a sixth part is added consisting of half leaf mould and rotten dung, with as much sand mixed with the whole as will keep it porous. Pot moderately firm, and place the plants on a front shelf where they will get plenty of light, in a house or pit, with a night temperature of 70°, allowing it to rise 10° higher with air during the day. Shade in the middle of the day in sunny weather, and give enough water to keep the soil moderately moist. Pinch out the points of the shoots as soon as growth has fairly commenced. This Aphelandra is of a somewhat erect habit of growth, and disposed to run up without branching out unless stopping the shoots is attended to. Syringe overhead in the afternoons, and close the house with the sun upon the glass; by the middle of July they will have made sufficient progress to bear moving into pots 2 inches larger, and now use the soil in a more lumpy state, but in the same proportions as before. Treat as hitherto in respect to heat, shade, and moisture, both at the roots and by syringing overhead, and keep the atmosphere all through the growing season moderately moist. About the end of August discontinue the use of the syringe, and give more air; as the weather gets cooler reduce the temperature 5°. They will now begin to throw up flower, and should be set in the lightest place the house affords. When the bloom spikes are half open the plants, if required, may be placed in a conservatory, if this is kept at an intermediate temperature. Should it not be warmer than an ordinary greenhouse, they must be allowed to remain in the stove, as they would not bear being kept too cold during the autumn. If whilst in bloom they are subjected to a somewhat lower temperature than they are opened in, no more water must be given than will keep the leaves and flowers from flagging, or the roots will be apt to suffer. As soon as the blooms have decayed the shoots should be cut back to within a couple of joints of where shortened at the stoppings in the summer. Keep the plants through the winter in a temperature of 60° in the night and a few degrees warmer in the day; give no more water than is necessary to keep them growing slowly. As the days lengthen give 5° more warmth day and night. By the end of March the roots will begin to move; they should then be turned out of the pots, and as much of the surface soil as is not occupied by the roots ought to be removed. Give a 3 or 4 inch shift according to the quantity of roots they have got, using the soil in a little rougher state than when the plants were smaller. When the potting is completed replace them in the stove, treating generally as in the preceding summer; they will require stopping only once unless it is deemed advisable to have some in flower later in the autumn. About the beginning of May pinch out the points and tie the shoots out in a horizontal position, so as to induce a bushy form. This will also cause some of the lower eyes to break and produce more flowering growths. The plants require very little support, but a few neat sticks should be used to keep the shoots in their places. Treat through the summer as in the first season. If only stopped once they will flower considerably earlier; when the bloom is over, again shorten back the whole of the shoots to a couple of eyes beyond the point where cut back to the autumn before, treating similarly through the winter. In the spring again turn out of the pots, and remove as much of the old soil as can be done without unduly disturbing the roots; repot in 2 or 3 inches larger size, which, unless very large specimens are required, will be found big enough to grow the plants in for a number of years, provided that a portion of the old soil is replaced by new as hitherto in the spring, and in addition a liberal supply of manure-water is given through the growing season; so managed, they will last for a dozen or more years.

In addition to A. cristata the undermentioned kinds are all deserving a place; they vary considerably in size, but all succeed with similar treatment, except that the smaller growers must not have so much pot-room.

A. aurantiaca. A handsome medium-sized plant from South America, with bright orange-coloured flowers, produced freely.

A. aurantiaca Roezlii. A beautiful species that produces splendid large flowers on small plants, deserving of a place in the most select collections of stove plants.

A. Fascinator. A remarkably fine species from New Grenada, with handsome variegated leaves, producing very large spikes of bright vermilion flowers.

A. Leopoldii. A robust growing plant, with broad shining foliage, and handsome bright yellow flowers produced in summer. A native of Brazil.

A. Leopoldii variegata. A form of the above that, in addition to its yellow flowers, has the leaves conspicuously variegated with creamy white; it blooms in summer.

A. nitens. A New Grenada species, with bright vermilion scarlet flowers springing from shoots bearing highly polished, deep green leaves.

A. Porteana. This grows to a medium size; it has orange-coloured flowers, produced freely towards the end of summer. From Brazil.

INSECTS.—Red spider and thrips will live on all the species, but are not very troublesome, being easily kept under by the daily use of the syringe in the growing season; all that is necessary is to see that the water gets well to the under side of the leaves. Mealy bug and brown scale will also infest them, but, from the comparatively few leaves which they make each season, these are easily kept down by a timely use of the sponge.

APHELEXIS.

The several species of Aphelexis are natives of the Cape of Good Hope, and are fine greenhouse plants, either for exhibition or decorative purposes; while their flowers, if cut when fresh and nicely dried, will last for many months. They are subject to brown scale, and from the peculiar form and arrangement of their leaves, it is not easy to thoroughly eradicate the pest, even while the plants are small; the difficulty becomes much greater as they get larger; and although it does not increase so fast as on plants that are grown in strong heat, such as are affected with it never thrive or look as they ought to. Cuttings, such as are usually obtained from about the base of established plants, or from the points of the principal branches after flowering, will be in right condition about August. Put them an inch apart in 5 or 6 inch pots in sand, keep close, moderately moist, and in a little warmth through the autumn and winter; by spring they will have got well-rooted, and should be moved singly into 3-inch pots in good fibrous peat, mixed with enough sand. Pinch out the points of the shoots to cause them to break, and keep through the summer in a light house or pit, standing on a moist bottom. They will be nice little plants by autumn, furnished with several shoots. Through the winter let them have a temperature of about 45°; in spring as soon as signs of growth are discernible move them into pots an inch or two larger using good peat, with enough sand mixed with it, again pinching out the points. The usual greenhouse treatment, without shade, is all they will require during the summer; winter as before. In spring give them pots 2 or 3 inches larger, according to the state of the roots; use nothing but good fibrous peat, broken to about the size of walnuts, and sufficient silver-sand to ensure porosity—say, one part sand to six or seven of peat. Pot firm and drain well, for these plants, in common with all others of a hard-wooded character from the same country, cannot endure stagnant water near their roots. After potting keep them shaded from strong sun, and as far from where the air is admitted as convenient. Keep the stage on which they stand syringed two or three times a day, as well as the outside of the pots; this will make it unnecessary to apply water to the roots for a long time after potting, and this is of the first importance in all tender-rooted plants, as it gives them time to commence pushing their roots into the new soil, after which they are much more likely to grow freely. In the course of a month they will stand exposure to the full sun and air. Through the earlier part of the growing season close the house by 5 o'clock, so as to shut in sun-heat, and syringe the plants at the same time, which will greatly assist the growth of these and all things of a similar character. By midsummer, if all goes on right, they ought to have made considerable progress and all the strongest shoots ought to have their points pinched out to ensure a bushy habit. All the Aphelexis are easily managed in this respect, being naturally compact growers. They are most impatient of an excess of moisture at the roots. This must be carefully guarded against in all stages of their growth, and the soil always allowed, before applying water, to become considerably drier than would be necessary in the case of such plants as Acrophyllum.

They should be kept through the autumn and winter in a light, airy situation, avoiding cold draughts, and keeping them in a night temperature of as near 45° as convenient. The shoots that were stopped in the previous summer will most likely not show bloom; but any flowers that do appear it will be better to pinch out. By the middle of April give them a shift into pots 3 or 4 inches larger, according to the strength of the plants and the condition of their roots, after which let their general treatment be such as recommended for the previous summer.

We have not said anything about tying. Naturally they are of a procumbent habit, and consequently they require more support than plants of erect growth; but use no more sticks than are necessary to keep them in shape. In all probability they will not require any more stopping, as if they are strong they will break sufficiently to furnish themselves. They ought to set bloom all over; but if the object is to get them on into large specimens as soon as possible it will be better to pinch the flowers out, as recommended in the previous year. If required to bloom, it will be necessary to keep them, when in flower, in a house where the atmosphere is quite dry, or the flowers will turn mouldy and lose their colour. The best plan is to allow a little top air all night over where the plants stand. If attention is paid to these matters, they will retain their beauty for a month; after which the flowers should be removed, and the plants treated as recommended in the previous seasons. After they have got big enough to produce a good display of flowers, they should be stood out in the open air through the month of August each summer; this will benefit them by hardening up their growth. Keep them after this through the winter at about 35° or 40°. Each season, until they attain full specimen size, they should have larger pots after flowering. There are three kinds that are sufficiently distinct to merit a place in every collection of plants.

A. macrantha purpurea. This is the deepest coloured, as well as the best constitutioned, variety. It is a good grower, making a full-sized plant in less time than any of the others.

A. macrantha rosea. There are several inferior plants sold for the true sort, which is one of the scarcest as well as most desirable hard-wooded plants in cultivation. When it is in good condition, its flowers are nearly 2½ inches in diameter, of a beautiful bright pink, forming a nice contrast to the last-named variety. It is a strong, but not quite so quick a grower as A. macrantha purpurea.

A. rupestris grandiflora. Is distinct enough from the two preceding to render it well worth growing.

The species of Aphelexis are longer lived than most other hard-wooded plants. If well treated they will often last for a dozen years or more, and at the end of that time be as vigorous as ever.

INSECTS.—Greenfly frequently attacks the young growths; to destroy it fumigate repeatedly. If affected with scale, dip, or syringe in the dormant season, with insecticide sufficiently strong to eradicate the pest.

ARALIA.

(Stove.)

Amongst the stove kinds of Aralia much difference exists, both as regards size and form; they are hard-wooded evergreen plants of comparatively free growth, and mostly erect in habit. They have little disposition to branch out, a property which befits them for associating with plants of bushy growth. They are increased both by cuttings and grafts, using for stocks such of the commoner species as are plentiful. The stocks should be prepared in the usual manner, that is, struck from eyes or cuttings, and grown on in small pots until they have attained the thickness of an ordinary pencil, when they should be headed down to a little above the base. The scions should be then inserted in any of the several ways by which plants of a similar nature succeed. We have found none better than the cleft and wedge method, keeping them warm enough and a little close until the grafts are united. But in the case of Aralias, as with most other things of a like character, propagation by cuttings and eyes is the method by which ordinary cultivators usually increase them. Plants that get naked and bare of leaves should have their heads cut off in the spring, making cuttings from such part of the upper portion as is only half-ripened, and of the extreme top as well; the matured part of the stem may be cut into bits and put in as eyes, like the cuttings, in a brisk heat. Keep them close and sufficiently moist until enough roots are formed; then remove the propagating glasses and pot off singly. Peat is most suitable for the weaker-growing kinds, loam being best for the strong ones. They will thrive in the warmth usually kept up for hot stove plants, say 65° in the night in spring, with a rise of 10° or 15° by day, and proportionately more as the season advances. Air must be given regularly through the growing season, with shade when the sun is powerful. These plants will bear the soil in a moderately moist state, and they should be syringed daily in the summer. Nothing more is necessary than to increase the pot-room, as the roots require it. Old stools of most of the species, when headed down, will push several shoots; these, if taken off with a heel when about 6 inches long, will root readily, and make plants in little time.

The undermentioned are the most desirable stove kinds:—

A. Chabrieri. A new species of small and elegant habit. One of the best of the small kinds.

A. elegantissima. This is from New Caledonia, and has an erect, slender stem; the leaves are digitate and on long stalks. A handsome plant.

A. filicifolia. A South Sea Island plant, having a purple stem, spotted with white; the leaves are elegant, fern-like, and deeply divided.

A. gracillima. Forms slender, graceful, erect stems, thickly clothed with deep green leaves, fern-like in their appearance, midrib white. A native of the South Sea Islands.

A. Guilfoylei. Another South Sea Island species, with an erect stem and shrubby habit; the leaflets are two or three inches in length, and margined evenly with white.

A. Kerchoveana. A pretty kind, with larger leaves than A. elegantissima.

A. leptophylla. Stem erect and slender, leaves large, and borne on stout stalks.

A. monstrosa. A new and very distinct kind, with pendant leaves, the leaflets margined with white. From the South Sea Islands.

A. Osyana. From the South Sea Islands. Another erect grower, bearing digitate leaves, the leaflets bilobed.

A. ternata. An elegant-habited sort; the leaves are serrated and opposite, pale green in colour. New Britain.

A. Veitchii. A plant with a tall, slender stem, and dark green digitate leaflets, narrow and undulated in the edges, so as to produce a distinct and handsome appearance. It comes from New Caledonia.

INSECTS.—Thrips will sometimes attack the young leaves, but these and red spider are easily kept down by the use of the syringe. Brown scale is their worst enemy, and where it exists should be got rid of by frequent sponging, as the leaves will not bear dressing with anything strong enough to kill the scale

ARALIA.

(Greenhouse.)

Amongst the different species of Aralia that will thrive with greenhouse treatment are several very handsome kinds, all evergreen, remarkable for their distinct foliage; they are very effective for greenhouse decoration associated with flowering plants, or for arranging in rooms, corridors, &c. They are easily-grown plants requiring no especial attention to keep them in good condition beyond the supplying of their wants with sufficient root-room and water, and the necessary attention to keep them free from insects, so that their leaves may not get disfigured. Their propagation and cultivation are the same as in the stove kinds, except that after the first stages they do not require to be kept so warm, an ordinary greenhouse temperature sufficing.

The undermentioned are handsome kinds:—

A. crassifolia. A New Zealand species, with handsome green leaves.

A. crassifolia integrifolia. A distinct form of the above.

A. crassifolia spathulata. Another form of A. Crassifolia.

A. heteromorpha. A desirable plant of medium growth.

A. papyrifera. A native of China, and a desirable plant with well-marked foliage.

A. Quinquefolia. A distinct and handsome species of moderate growth, with glossy leaves.

A. Sieboldii and its variegated form are from Japan. Both are very handsome plants, that, in addition to their merit for greenhouse use, are amongst the best subjects for room decoration existent. Their palmate glossy leaves are very handsome and bear dust and an indifferent atmosphere better than most things. They also do well out-of-doors in the south-west of the kingdom in summer, but suffer more or less in the open air in a severe winter.

ARAUCARIA.

These are evergreen trees of most elegant habit, that in their native countries attain

ARALIA SIEBOLDI.

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a height of from 50 to 100 feet. This fact obviously precludes the possibility of their being cultivated in glass structures except whilst in a comparatively small state; yet, so distinct and handsome are they, even while young and not yet of a size to show much of their true character, that they are often used in large conservatories, where, occupying a central or other commanding position, they are effective for some years, or so long as they can be kept within bounds. A. excelsa is especially adapted for such use, its noble plume-like branches having the appearance of gigantic ostrich feathers.

The method of propagation is from cuttings of the firm wood taken off in the autumn and inserted five or six together in 6-inch pots four-fifths filled with a mixture of sand and sifted loam, with a little sand on the top. In this insert the cuttings made from pieces of the points of the shoots about 6 inches long. They should be kept at a warm greenhouse temperature, watered so as to maintain the soil fairly moist, but not closely confined. In the course of the winter the cuttings will callus, and form roots before or during spring; when a fair amount are made move singly into 4 or 5 inch pots, and keep the plants in a pit or house where they will get a little less air than ordinary stock until they begin to grow freely. Then give more air, and water so as to keep the soil moderately moist. Nothing more will be required through the summer except the ordinary routine of management needful for greenhouse plants; the winter treatment also requires to be similar to that which answers for the general occupants of the greenhouse.

About March they will need moving into pots 3 or 4 inches larger. Araucarias like good yellow loam if such is at hand, and as they are free-rooters it need not be broken very fine, but add enough sand to secure the water passing freely through; at the same time pot firm. They will now grow away freely, and must be stood far enough apart to keep them from being at all drawn, for on this depends their satisfactory appearance, and as the object is to get short-jointed, well-furnished specimens, rather than to induce rapid upward extension, they must have plenty of light and air. From this time forward their treatment needs to be of the simplest character. Each spring for two or three years give them pots a couple of inches larger, and after that time they may go for two or three years without moving according to the apparent state of the individual plants in requiring sustenance. In this it is necessary to take a medium course between allowing too little and too much root-room; if the latter is given they are made unwieldy, and their increase of size is accelerated so that they soon get too big for even ordinary large houses. This especially applies to A. excelsa, the kind which is most grown. Where there is a likelihood of any of the species soon getting too tall for the house they occupy, their upward extension may be retarded by cutting the leading stem back two or three joints, severing the top just above a joint; this should be done in spring some weeks before growth commences. The eyes immediately below the point where cut back to will start, and from the shoots thus produced select the most promising for a leader and remove the others. In this way a new top will be secured to take the place of that removed, and by the adoption of this course at intervals growth is directed more into the side branches, and top extension checked so as to keep the plants more within bounds. When too large for the house in which located they must be discarded, others having previously been prepared to take their place.

All the species can be raised from seed where such is to be had, but for private use propagation by cuttings will generally be the best.

The undermentioned are all suitable for use as already mentioned:—

A. Cookii. A distinct-looking plant, much denser in growth than A. excelsa, differing altogether in its general habit. From New Caledonia.

A. Cunninghamii. An Australian species that forms a handsome specimen, retaining its leaves in a way that keeps the plant densely clothed. It is a moderately quick grower, but does not attain height so rapidly as A. excelsa.

A. Cunninghamii glauca. A glaucous form of the last named. From Port Molle.

A. elegans. A New Caledonian species, of smaller growth than the others. It has elegant slender branches, the foliage very bright green.

A. excelsa. The most beautiful of all the species, and also one of the most elegant plants ever introduced. Norfolk Island.

A. excelsa glauca. A variety of the above, with distinct glaucous leaves.

A. Rulei. A handsome plant with a very distinct form of growth; its slender drooping branches have a charming appearance where there is room to give it sufficient scope. It is in the way of the hardy A. imbricata, but much more slender, and the branches are more numerous. From the Papuan Archipelago

A. Van Geertii. A more recently introduced kind, that forms a pretty specimen, differing in appearance from any of the others. It attains a medium size, and is a moderately fast grower.

Insects.—Resinous plants of this description are not usually much troubled with insects. A free use of the syringe during the growing season will generally keep them clean.

ARDISIA.

A. crenulata is a compact-growing, cool stove, evergreen plant from the West Indies. Its flowers are small and unimportant, but they are succeeded by an abundant crop of brilliant berries, which are very showy. They are about the size of Haws, when ripe bright red in colour, and produced in bunches comparatively large for the size of the plant. They are also very persistent. This Ardisia is much used as a room plant, a purpose for which its general character well adapts it. It is best increased from seed which, if sown at the beginning of the year in moderate-sized pans filled with sandy peat sifted fine, the seeds covered about half an inch, and stood in a house or pit where a temperature of 65° or 70° can be kept up, will soon vegetate. After they have begun to grow place them where they will receive a fair amount of light. Keep the soil moderately moist, and when they are large enough put them singly in small pots and stand them on some moisture-holding material, such as sand or ashes. This is an essential matter with seedling plants in little pots, for if they are stood on dry shelves, particularly in the summer time, they get dried up quickly, and are thereby injured. Give them ordinary stove treatment during the summer as to water, heat, air, and shade; by the end of July they will bear moving into 4-inch pots, and afterwards encourage growth until the middle of October, when the temperature should be reduced gradually for the winter, through which 55° or 60° will be enough. Increase the heat about the end of February, and in the course of a month they will want moving into 6-inch pots; treat them afterwards as advised for the previous summer. This Ardisia does not require stopping, as it will branch out sufficiently of its own accord.

As winter approaches reduce the temperature, and increase it about the time advised in the preceding season; in spring the strongest plants may be moved into pots an inch larger, but it is not advisable to give more root-room than is absolutely necessary, as the smaller the pots the better the plants will look, and those that are not shifted can be helped with manure-water. They will flower in the spring or summer according to the temperature they are subjected to. Give them, especially whilst in bloom, plenty of light, which will help the flowers to set; all that is necessary further is to continue treating them as already advised. By autumn, if all has gone well, the berries will be fully coloured, and they can be used with advantage for decoration in a warm conservatory, or intermediate house, or in living rooms as already mentioned. If the plants are well managed they will be nice pyramids with healthy foliage down to the bottom, their handsome dark-green crenulated leaves contrasting well with their bright-coloured berries. If desired, they can be grown on larger by giving them more pot-room, but they never look so pretty as in the first season of their fruiting—consequently it is well to keep up the stock by sowing some of the berries every year. The plant will strike from cuttings made of the young shoots, treated when rooted as advised for the seedlings.

A. crenulata alba. Is a white-berried variety of the above, and will succeed with similar treatment.

A. Oliveri. This is a handsome decorative plant from Costa Rica, quite distinct in habit and general appearance from the preceding kinds. The flowers are bright purple. It is propagated by cuttings struck in the usual way, and when rooted treated as recommended for A. crenulata.

Insects.—The stout texture of the leaves does not offer much attraction for the smaller insects that prey on stove plants, and the syringing to which the plants are subjected daily during the growing season will keep them down. Scale or mealy bug must be removed by syringing with insecticide or by sponging.

ARECA.

A handsome genus of Palms, most of which grow to a considerable height, but for many years may be kept within moderate size. Nearly all the species require a stove or intermediate temperature.

For propagation and cultivation, see Palms, general details of culture.

A. Alicæ. A dwarf-habited kind, with pinnatisect leaves. Being amenable to cultivation in a lower temperature than many, it is a desirable species. It comes from Australia.

A. alba (syn.: A. Borbonica). This species is very handsome while in a young state, and has a noble appearance as it gets older; the leaves are pinnate, and of a lively green colour. A native of the Isle of Bourbon.

A. Baueri. A robust grower, with large, handsome pinnate leaves. The plant will bear a temperature in winter a little above that of a cool greenhouse. It comes from Norfolk Island.

A. catechu. A stately, tall-growing species, with bold pinnate leaves of a bright green colour. It is a useful decorative kind whilst in a small state, and is interesting as being the species that produces the Betel Nut, so much used in the countries where it grows. From India.

A. lutescens. A favourite species, that thrives with a little more warmth than a greenhouse. It is an elegant plant, with slender, yellowish-green stem, and handsome, plume-like, pinnate leaves. It will bear the temperature of a greenhouse in summer. A native of the Mascaren Islands.

A. sapida (*syn.: A. Banksii*). A handsome kind, with distinct appearance. Especially desirable whilst in a small state. Norfolk Island.

A. Verschaffeltii. A very elegant Palm, with drooping pinnate leaves, that can be kept for years in a small state. It requires to be kept moderately warm in the winter. Mascaren Islands.

ARENGA.

An interesting genus of stove Palms, not many in number, but well worth growing.

The method of propagation and after management will be found under Palms, general details of culture.

A. saccharifera. A sugar-producing species, which also affords fibre for rope-making in its native country. From the Philippines and Mollucas.

A. Wightii. A handsome dwarf species with pinnate leaves. It comes from India.

ARGYREIA.

A limited genus of evergreen stove plants, few of which are much in favour with cultivators. They are of climbing or twining habit, requiring a good deal of room to grow in.

They can be propagated by shoot cuttings put in in spring in sand, and kept close, moist, and shaded in a brisk heat. When rooted pot singly, and grow on under ordinary warm stove treatment, giving pot-room as the plants increase in size, until they are large enough to plant out. They will grow in either peat or loam, but the latter is best for these and other things that are inclined to make a deal of growth.

The following are the best of the kinds in cultivation :—

A. cuneata. Flowers purple. An autumn bloomer. A native of India.

A. ornata. A white-flowered species that blooms in summer. India.

A. splendens. Flowers pink, produced in summer or autumn, according to the degree of heat it receives. India.

INSECTS.—Thrips and mealy bug are often troublesome on these plants. Syringe freely during summer with clean water, and in winter, when they are at rest, with insecticide to destroy the bugs; for thrips fumigate.

ARISTOLOCHIA.

Amongst the immense number of plants in cultivation few can take precedence of these in regard to the singular formation and colouring of the flowers, which are totally unlike anything else in the whole vegetable kingdom, so much so as in appearance not to convey the idea of a flower at all, but rather of a grotesque imitation of some imaginary animal. Aristolochias are remarkably free-growing plants, mostly from the hot, damp regions of the western hemisphere, and, as such, particularly suited for clothing pillars or rafters in warm stoves. They are also easily grown in the shape of trained specimens if required, and so managed their singular flowers can be more easily examined. They are very readily struck from cuttings made from half-ripened shoots, taken off with a heel. This is necessary, as, if the strong succulent growths are used, they are very liable to damp off unless the base of the cutting consists of a portion of the more solid wood, formed at its junction with the mature shoot from which it has sprung. They will strike any time of the year with sufficient heat, but are generally in the most suitable condition about the end of March. Put them singly in small pots, with a little drainage in the bottom, on which is placed a mixture of half-sifted peat and sand, with a little clean sand on the surface; place them under a propagating glass, and keep the soil moist, as succulent cuttings of the nature of these Aristolochias require a good deal of moisture. If this is not given them they are likely to flag, and the formation of roots is seriously retarded; let them be in a temperature of 70°, and shade closely from the sun. They will root in a few weeks, when at once transfer them to 6-in. pots. Being mostly strong growers, they will succeed in almost any description of good soil sufficiently porous to allow the large quantity of water they need to pass freely through it, but good loam is preferable to peat, as in it they do not run so much to leaf, and form flowers more freely. For this first potting, sift the loam and add one-sixth of leaf-mould and a moderate quantity of sand. Keep them in a temperature of 70° during the night, with 10° higher in the day, and give a little air when the weather is sunny; a slight shade will be required when it is bright, and use the syringe freely in the afternoons. By midsummer the roots will have filled the pots, and they should then be moved into others 3 in. larger; use the soil in similar proportions of loam, leaf-mould and sand, but do not now sift the loam—break it by hand, press the material firm in the pots, and pinch out the points of the shoots so as to induce them to throw out several breaks.

Treat them through the summer as already advised as to shade, giving more heat and air as the season advances, and, when the growth requires it, place in the pots several moderately tall sticks, round which wind the shoots of the climbing species; but do not allow them to twine to the sticks or each other, or they will cling so fast as to run the risk of injury when they are removed. At the end of August cease shading, and also the use of the syringe, giving more air to discourage further growth and ripen up the wood. Keep the plants through the winter in a moderately light position in a temperature of 60°, or a little over, in the night, with a few degrees more in the daytime, but never allow the soil to become so dry as advisable with things that produce smaller leaves of a harder texture. By the beginning of March raise the night temperature 5°, and 10 with sun-heat in the day, and at the same time move the plants into their blooming-pots; these should be 15 inches in diameter, with a couple of inches of crocks in the bottom, covered with fibrous material to prevent the soil being washed down by the large quantities of water they will want almost daily through the growing season. At this potting use the soil in a more lumpy state; add one-fifth of rotten manure and leaf-mould in equal proportions, and a fair amount of sand. Use the potting-lath freely, so as to make the whole moderately solid. The plants should now be placed where they are intended to bloom; if to cover a pillar or rafter, they should at once be trained to such. There is no place that they can occupy with more advantage than run lengthways over a path in the stove; so placed they utilise space that is seldom filled, and are in a good position for their flowers being seen to advantage. Such a situation gives an excellent opportunity for a free use of the syringe, so as to get the water to the leaves on all sides. This is necessary, otherwise red spider is sure to become troublesome. There is nothing better to train the shoots to than thin strings placed 6 inches apart, on each of which allow a single shoot to twine. As the days lengthen, raise the night temperature to 70°, or a few degrees over, according to the state of the weather, with 10° more in the day. As the pots get filled with roots, an abundant supply of water will be required. They will now grow apace, and by the middle of June will most likely show their flowers, which are produced from the axils of the leaves over a considerable extent of the growing shoots. The plants may be allowed to go on flowering through the summer where they are growing, or, if desired, the strings may be cut, and the shoots wound round several sticks, inserted inside the rims of the pots, or a trellis may be used on which to train them. In this way, if wanted, they can be placed for several weeks whilst the weather is hot in a warm conservatory—first preparing them for the change by putting them at the coolest end of the stove, where they will receive more air. While in a cooler house stand them at a distance from where air is admitted, otherwise such a check may be given to the advancing flowers as will cause their falling off before opening. When the blooming is over remove them back to the stove, placing them at the coolest end and admitting sufficient air to ripen up the wood, and discourage further growth by giving no more water than needed to prevent the leaves flagging. Winter in a similar temperature to that before advised, and by the end of February cut the shoots back to within about a yard or 4 feet of the base of the plants. Give a little more heat, and, when the young growths are a few inches in length, turn the plants out of the pots and remove as much of the old soil as can be got away without injuring the roots; place them in pots 3 in. larger, and treat in every way through the spring and autumn as recommended for the season previous. Cut back freely each spring to within a few joints of where they were shortened the preceding year, and partially remove the soil at potting time; they will not need larger pots, but should, through the early part of summer, be freely supplied with manure-water, and in this way the plants will last for years. Where required to cover a considerable space they may be planted out, but even in this case they should not have too much root-room, or there is no keeping the larger growing varieties in bounds without having to use the knife so as to seriously interfere with their flowering.

The undermentioned stove species are all fine kinds, differing considerably in strength of growth, but all thriving in similar soil, and requiring the same treatment in other respects :—

A. Duchartrei. A medium-growing climber, can be accommodated where the larger species would not have room. The flowers are straw-coloured inside, with brown veining, brown without. From the Upper Amazon.

A. floribunda. This is a native of Northern Brazil, from the Amazon district; it is a plant of medium growth, producing a profusion of flowers; in colour, a combination of yellow and reddish purple. It is very suitable for growing as a trained pot specimen, not being too strong and rampant in growth. It is not much known, and on account of the locality it is introduced from, may very likely do with less heat than the other species; this would make it doubly valuable as a decorative plant.

A. galatea. A free-growing species from Bogata, with cream-coloured flowers, covered with purple veins.

A. gigas. A very strong-growing species, from Guatemala, with a good deal of the flower of a palish purple; blooms in July and August; suitable only for a pillar or rafter.

A. Goldieana. One of the largest of all the species. A strong-growing climber, suitable for a large stove, where there is plenty of room. The flowers are very large, the colour on the outside is an olive shade of yellow, inside bright yellow, covered with red veining. From Old Calabar.

A. leuconeura. A stout kind, of bushy habit, the nerves of the leaves white. Flowers purplish brown, veined with yellow. A native of New Grenada.

A. ornithocephala. A native of Brazil; flowers somewhat resembling a bird's head in shape, pale yellow ground, covered with a network of blackish purple; a very handsome sort. Blooms in June and following months; suitable for either pot specimen or rafter.

A. tricaudata. This is a shrubby habited species from Mexico, bearing yellow and reddish-black flowers.

INSECTS.—Aristolochias are not much troubled with insects, except red spider, which in hot summer weather will soon injure the leaves and make them unsightly if the plants are not regularly and freely syringed. Brown scale and mealy bug will sometimes make their appearance, but can be removed by sponging and syringing. The yearly heading down also gives an excellent opportunity for washing the stems when at rest with a strong solution of insecticide.

ARTOCARPUS.

In these we have evergreen trees. A. incisa is the Bread Fruit; in common with the others it grows to a large size in its native country, requiring much room, and on that account it is not likely to produce its fruit in this country. But the plants bear handsome foliage, and for this reason are considered by some worth growing whilst in a small state. They strike from cuttings of the shoots, put during spring in small pots, filled with sand, kept close, moist, and shaded in a temperature of 80°. When rooted sufficiently, move into others a size larger; ordinary loam answers for them. Still keep in a high temperature—they will bear as much heat as most plants; give a little shade with some air in the middle of the day, and stand them as close to the glass as convenient, so as to counteract their disposition to spire up quickly. If this be attended to there will be no necessity to stop the leading shoots, as the plants will push outside branches of their own accord. If the pots get too full of roots before autumn, they must have another shift, or they will lose their lower leaves. Keep cooler through the autumn with a drier atmosphere, and winter in a night temperature of 68° or 70°. Give larger pots in spring, and treat during the summer as in the preceding; by the end of this second season the plants will get as big as they need be, and it will usually be found best to destroy them, and to propagate young ones to take their place.

The following are the most desirable kinds:—

A. Cannonii. A distinct-looking sort, with bold handsome leaves.

A. incisa. An interesting species, with pretty leaves; one of the best.

A. laciniata metallica. The leaves of this kind have a distinct metallic lustre. The above are indigenous to the hottest parts of India and the South Sea Islands.

INSECTS.—These, like most other plants that require a high temperature, are subject to the attacks of mealy bug, which, where present, can only be kept under by a diligent use of the syringe and sponge, as their leaves are not of a texture to bear much hard usage. Should thrips or red spider make their appearance, syringe freely, getting the water well to the undersides of the leaves, where these little pests most congregate.

ARUNDO.

The finest kind, *A. conspicua*, is a native of New Zealand, and looked upon as hardy, or like the better-known *Gynerium argenteum* (Pampas Grass), which in most parts of England will live out of doors through our winters without protection. For a large, roomy, cool conservatory the plant under notice is one of the most effeotive that can be used when well managed. It is very similar in appearance to the Gynerium, but forms longer flower stems, which are not so erect in their growth, the beautiful feathery plumes are more drooping in habit and have a more elegant appearance ; like the Pampas Grass they are white in colour

Arundos can be raised from seed sown in the spring in pans of sifted sandy loam. The seeds should be covered very lightly, and stood in a greenhouse or cold frame, protected from frost ; keep the soil moderately moist until the young plants appear, when give air in accordance with the weather so as to prevent the growth being weak—to further avoid which stand near the glass. As soon as large enough move singly into small pots. The after attention required is to pot on as often as the roots fairly fill the soil ; ultimately they will need good-sized tubs or large pots, as if cramped for room they will flower weakly, or not at all. Most likely three seasons' growth will be required to cause them to flower sufficiently to be effective. In the summer the plants will be better (except when in bloom) out-of-doors in a light, airy position, the pots plunged in ashes to prevent the soil drying so quickly. During winter, or, better still, until the plants get large, they should have the shelter of a house or pit from which frost can be excluded, where they can be kept at a cool greenhouse temperature, by which means they will sooner grow to a handsome size. The large, feathery, arched inflorescence of A. conspicua remains in good condition for several weeks, during which time few things are more effective in a large plant-house. They increase freely by division of the crowns, which should be effected in the spring just before growth begins ; pot the pieces singly and treat afterwards as advised for those raised from seed.

A. donax and its variegated form are both handsome plants that can be similarly used. From Southern Europe.

INSECTS.—These plants do not seem to be much troubled with insects ; greenfly will sometimes establish itself on the young grassy leaves, and the best remedy is fumigation.

ASPARAGUS.

The scandent-habited kinds of Asparagus are extremely elegant plants, although the flowers are insignificant. A. decumbens has been long grown as a greenhouse climber, and we have little doubt that the beautiful A. plumosus and others of a like description, of more recent introduction, will bear greenhouse treatment.

They can be increased by division of the roots, or by shoot cuttings in spring, inserted in sand, stood in a temperature of 70°, kept close, moist, and shaded. When rooted, move singly into 3-inch pots, using good peat and a little sand ; give cool stove treatment through the summer and until the plants attain some size, during which time larger pots will be required. Through the ensuing winter it will be well to keep them in a growing temperature of 50° in the night, by which means they will get on much faster, and in spring they should again be moved to larger pots, and have their shoots trained to the rafters or pillars they are required to furnish. After this, nothing will be necessary but to give more root-room as wanted, and to keep the shoots regulated. The following are very beautiful kinds, their feathery green leaves being extremely handsome :—

A. consanguineus.
A. decumbens. A well-proved sort.
A. falcatus.
A. plumosus. South Africa.
A. plumosus nanus. South Africa.

INSECTS.—Aphides will sometimes attack the young shoots, and should be met by fumigation. If they are affected with scale or mealy bug, sponge carefully and syringe freely with clean water.

ASPIDISTRA.

The only species of these pretty and most useful decorative evergreen greenhouse plants that find much favour with cultivators are A. Lurida and its variegated form, which latter, since variegated plants have come into fashion, is generally grown by most people fond of handsome-leaved plants. Independent of the effective character of the handsome lanceolate leaves, which are supported on stout erect stalks, and are of a most enduring character, Aspidistras have the merit of thriving under conditions of deficient light and a dry atmosphere, such as few plants can endure at all. Hence they are amongst the best room plants for growing in towns, not simply existing, but growing in a way that bids defiance to adverse surroundings. A. lurida is all but hardy in the most favourable parts of the kingdom, but like some other plants that are similarly accommodating it thrives faster and looks better when grown in a little warmth, say that of an intermediate house, under which condition the leaves get larger and have a brighter appearance. These Aspidistras are of very easy growth, but do not make nearly so much progress as some things; their leaves are produced from underground stems or rhizomes. The flowers, which are insignificant, are also produced underground, and thus far the plant is singular.

The mode of increase is by division of the stems, which, as already said, are beneath the surface and spread. If a large specimen is at hand, the right course is in the spring, before growth begins, to turn it out of the pot, and shake all the soil from the roots; disentangle them as far as possible, and then divide in pieces in size as may be required. If numbers are wanted the stems may be so far divided as to reduce each piece to a single bud with its leaf attached, retaining as much of the stem and roots to it as available. If, when the specimens are too large, there is no object beyond reducing them to a convenient size, they may simply be divided into four or six so as to meet the requirements of the case. The pots should be sufficiently drained to ensure the water passing away freely, and large enough to admit the roots without their being too much cramped. The soil should consist of good loam, with a little sand and a small quantity of rotten manure; press the material well about the roots, and place the plants where the temperature can be kept at about 50° or 55° by night, with a rise of 10° or so in the day. Give water when the soil seems to require it. In the matters of air and water, such treatment as answers for the generality of cool stove plants, with a little shade in very bright weather, should be adopted; syringe overhead slightly whilst growth is going on. After the roots have begun to extend leaves will be made, more or less according to the size to which the divided pieces have been reduced, but these plants, as already said, do not grow very fast, and when the leaves that first spring up are fully matured no more growth is generally made with newly-divided plants that season, except where a highly-exciting temperature is kept up. It is better not to subject the plants to this, as the object should rather be to get foliage with plenty of strength and substance in it than such as is thin and not calculated to endure for several years. After the growth is finished keep the plants at a warm greenhouse temperature through the autumn and winter. When they are about to commence growing in spring give pots a little larger if the roots have well filled those they are already in, but do not at any time overpot; yet, now when the object is to get the plants on in size they must not be too much cramped. Pots an inch larger for small, and 2 inches for larger, plants will be big enough. After shifting, place them in a temperature similar to that advised for the spring previous, and treat subsequently in all respects as in the preceding season, which will be all that is needful each ensuing year, simply giving pot-room more or less according to the size the plants are wanted to attain. Although Aspidistras will live in a pot-bound condition it is not well to let them get into that state, as it causes the leaves to come small and to have a sickly appearance. Like most other plants the leaves of the variegated form are not so well able to bear hard usage as the green sort, which is no doubt the original; but either, except whilst growth is going on, may be stood in places where only little light reaches them. Once fairly established either of the forms will grow well when kept continually in an ordinary living room, but when so treated the leaves should be frequently sponged to free them from dust. They come from China.

INSECTS.—Most insects that affect plants will live on Aspidistras, but the hard texture of the leaves prevents much injury being done them. Still thrips and red spider leave their mark if allowed to gain a footing. When the leaves are affected wash with insecticide for bug, scale, or red spider; if thrips or aphides appear fumigate with tobacco.

ASPIDIUM.

A genus of Ferns, comprising both stove and greenhouse species. Though distinct-looking, they are not so handsome as many in cultivation.

For propagation and cultivation, see Ferns, general details of culture.

The undermentioned stove species will be found the most desirable:—

A. dilaceratum. Jamaica.
A. macrophyllum. Tropical America.
A. triangulare.
A. trifoliatum. Brazil.

ASPLENIUM.

An extensive genus of Ferns, including stove, greenhouse, and hardy kinds.

Amongst the hardy species are several well known, indigenous to Britain, as, for instance, A. marinum and the pretty little A. viride.

For propagation and cultivation, see Ferns, general details of culture.

STOVE SPECIES.

A. Belangerii. Java.
A. ebeneum. North America.
A. flabellatum. Mexico.
A. fragrans. Jamaica.
A. obtusilobum. New Hebrides.
A. pulchellum.

GREENHOUSE SPECIES.

A. bulbiferum. New Zealand.
A. elegantulum. China.
A. lucidum. West Indies.
A. Novæ Caledonæ New Caledonia.
A. rhizophorum. Jamaica.
A. viviparum. Mauritius.

ASTRAPÆA WALLICHII.

An evergreen stove tree that bears handsome flowers. It is an effective plant where it can have room to extend.

It strikes readily from shoot cuttings in spring, taken off with a heel, and inserted in sand, kept moist, close, and shaded in a temperature of 70°. When well rooted, pot singly in turfy loam, and encourage growth by keeping them in a temperature similar to that in which they were struck, with shade when sunny, and a moderate amount of air in the day. The air given should not be enough to dry the atmosphere unduly, as the plant likes to be moist while growing. Give larger pots about the end of June, putting a stick to each for support. Cease shading towards the end of August, admitting all the light possible, with more air. Winter in a night temperature of 65°. In spring larger pots will be needed, and soil such as before should be used; treat through the summer as previously, and also during the ensuing winter. After this, all that is necessary is to give the requisite root-room, large pots being needed, except where it is intended to plant out.

There are several kinds of Astrapæa in cultivation, but the above-named species will be most likely to give satisfaction. It comes from Madagascar; the flowers are pink, opening in summer or autumn.

INSECTS.—This Astrapæa is subject to the attacks of mealy bug, scale, and thrips; for the last fumigate. If mealy bug is found troublesome, syringe freely with water in summer, and, when at rest, wash with insecticide; for scale, sponging will be best.

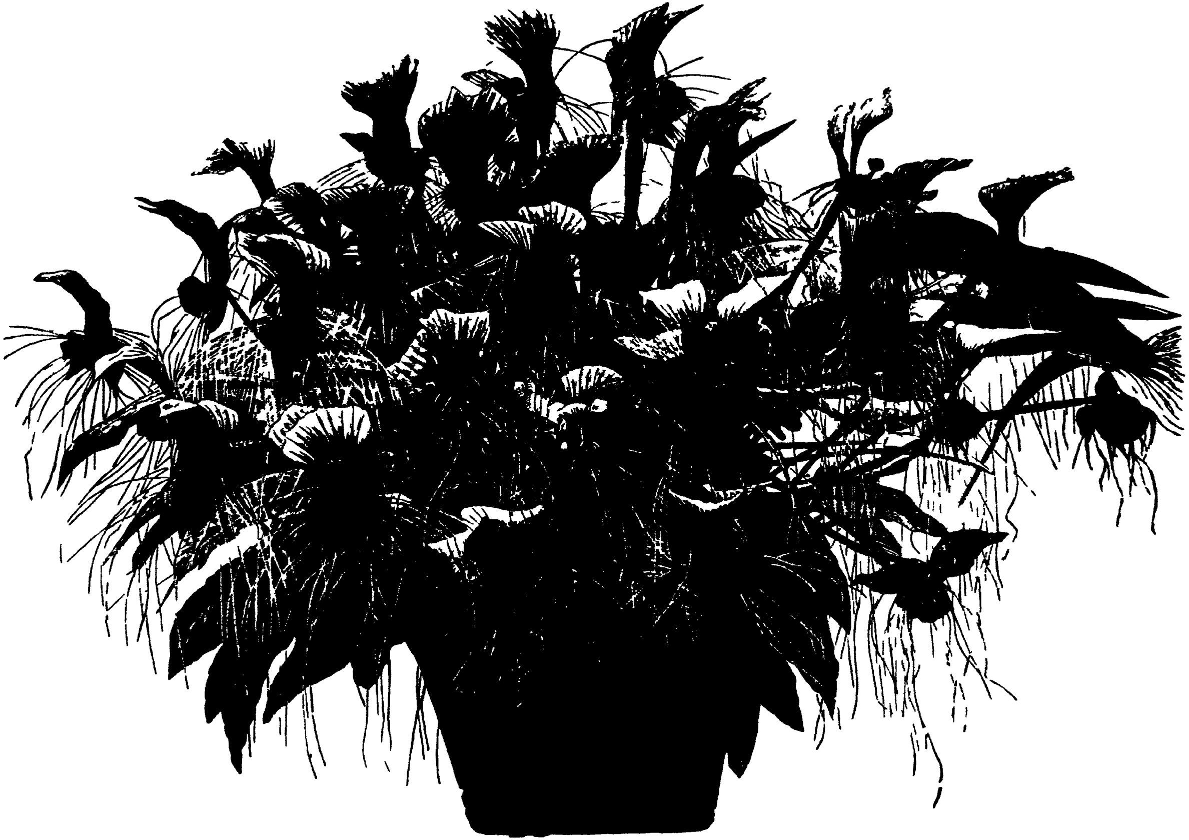
ASTROCARYUM ARGENTEUM.

A distinct-looking stove Palm, with drooping leaves, deep green on the upper surface, silvery beneath. From Colombia.

The method of propagation and after cultivation will be found under Palms, general details of culture.

ATACCIA CRISTATA.

The first impression produced by an inspection of this most singular warm stove plant is one of wonder as to the uses of the different strange appendages that are attached to the flowers. One might be pardoned for coming to the conclusion that it was the result of an effort on the part of nature to produce something in the vegetable world totally different from everything else. In form, as also in texture, we find nothing like it; there are a few others nearly allied to this Ataccia, but it may be taken as the best representative. The root-fibres are thick and coarse, proceeding from a stout, short root-stock, from which issue the leaves, some five or six in number. The petioles are smooth, a few inches long; the blade of the leaf is oblong acuminate, of a dark-green colour, nerves prominent; in a strong plant the leaves attain a height of 18 inches. As many have not seen the flower, a description may be of use. The scape rises well above the leaves; it is erect, smooth, and terminated by a large four-leaved membranaceous involucre; the two outer leaflets are opposite, the two inner are placed side by side, erect, very large, almost transparent, and, like the rest of the flower, of a deep chocolate colour. The numerous peduncles are each terminated by a single flower, forming a drooping umbel. Besides these floral peduncles there are a number of others, sterile, long, drooping, and tendril-like in shape; these still further increase the singularity of the flower, than which nothing in the whole vegetable kingdom is more calculated to interest even the most casual observer. The plant is easily grown, provided a few things essential for its existence are kept in sight. It is found indigenous in Malacca, occupying moist, damp situations; this shows that it should always be kept in a comparatively high temperature, and that the soil should never be allowed to get dry. The fact of this and many other plants luxuriating naturally in swampy ground often leads to their being subjected under cultivation to a course of treatment that is



ATACCIA CRISTATA.

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fatal to their well-being. It is frequently supposed that, because a plant grows in a state of nature in soil saturated with stagnant moisture, an imitation of this is essential under pot culture; whereas with these moisture-loving subjects it is just as necessary that their pots should be well drained, and the soil in which the roots are placed of such a character as will allow the water passing freely through it, as it is with plants that exist naturally in drier ground. Anything approaching a sour condition of the soil, or deficiency in the drainage, will quickly cause the roots of the Ataccia to rot; after which it is very difficult to prevent the plants from dying, as when reduced to this state they are slow in forming fresh fibres, and the soft nature of the leaves and stem is such as to cause them to flag and shrivel up.

The plant is propagated by division of the side shoots which are thrown out from the main stem. As these are produced but sparingly, it increases slowly. The side shoots are generally emitted near the surface of the soil, and in a few months after their appearance push out roots from the base, independent of those that support the plant. When these have attained an inch or two in length, and are about to enter the soil (in which state they will generally be found towards midsummer), the side growths may be taken off with these roots attached, and placed singly in 4 or 5 inch pots, according to the strength of the crowns. The pots should have an inch of crocks in the bottom. The soil ought to consist of the best fibrous peat, with a good portion of the earthy matter shaken out—four parts to one of fine broken crocks and sand in equal proportions. Secure them in the pots with two or three small sticks, and give enough water to settle the soil. They should then be placed under a propagating glass, but not kept so close as many things would require to be, or they will be liable to rot. They should stand on a moist bottom, in a temperature of 70°, or a little over, in the night, and 10° higher in the day with sun-heat. They must be shaded from the sun. In the course of a month or six weeks they will be well-rooted, and should be placed on a side shelf near the glass. The plant likes plenty of light, but will not well bear exposure to the sun in bright weather. When they have got inured to the full air of the stove, if in the smallest pots advised, they should be moved into others an inch larger, with soil similar to that in which they were first placed; admit a moderate amount of air every day all through the summer, give plenty of water to the roots, and moisten overhead with the syringe in the afternoons when the house is closed. About the middle of September the temperature should be lowered 5° in the night and 7° or 8° in the day, more air given, and both shade and syringing discontinued; as the days get shorter reduce the heat a little more, and keep through the winter in about this temperature. During this season they make little growth, and should not have nearly so much water, but on no account must the soil be allowed to get so dry as required by many plants at this time. When the days lengthen at the beginning of March, raise the heat 5° in the night, and 6° or 8° with sun-heat, giving a little air in the middle of the day; they should then be shifted into pots 2 inches larger, and the soil used should be as before. When the weather gets warmer, shade will be necessary in the middle of the day, and the temperature should be raised day and night to the maximum point to which they were subjected the preceding summer. The strongest will most likely push up one or more flower-scapes through the course of the season, but these will be much smaller than those that may be expected as the plants get stronger. Treat in every respect as advised during the previous summer and autumn, again reducing the temperature as the days shorten, and winter as before. In the ensuing spring, about the same time, give them pots 1 or 2 inches larger, according to the progress they have made; but they must not at at any time be over-potted, as they cannot endure too much root-room. A 10-in. pot is large enough for a full-sized specimen that has got several crowns. The strongest plants will in all probability form a second crown during the season, and go on increasing each summer; if it is thought desirable to increase the number of plants rather than to grow them into larger specimens, they may be divided and treated as advised in the first instance. But it is when they have got from three to five crowns each that they become the most effective, as in this size they will often push up four or five flower stems at a time; and when the plants are strong they will also bloom oftener. There is no stated time for their flowering, as when strong they usually produce a spike of flowers from each leaf, coming in at intervals through the growing season, but most of them appear in the spring, when active growth has fairly commenced. It is not well to syringe them overhead at the time the young scape is issuing from where it is produced—the inside of the base of each leaf-stalk—as this sometimes has the effect of causing it to damp off. As the plants go on the lower leaves will decay and fall off, leaving a considerable length of bare stem that will show a disposition to throw out roots; if, when these appear in the summer, a little sphagnum moss is tied round the stem just under the leaves, the roots will quickly push into it; the crown may then be cut off just under the roots, placed in a pot proportionate in size, and treated as advised with the smaller crowns, when it will soon get established. The stool that remains will push up several growths, as there is a dormant eye at the point where each leaf has been produced. These can either be taken off and grown singly in pots, or may be allowed to remain intact, if preferred. Each spring, just as the plants are beginning to grow, they should be turned out, and as much of the old worn-out soil removed as can be got away without breaking the roots; and when they have occupied pots as large as already advised they may be placed in the same with fresh soil.

INSECTS.—This Ataccia is little troubled with insects, its juices appearing to be of too crude a nature to be congenial to their tastes. Thrips may sometimes, though very rarely, make their appearance on the backs of the leaves, and can easily be destrōyed by syringing. Should greenfly be troublesome, it is best dealt with by fumigation.

AZALEA.

Of all the greenhouse plants in cultivation, either as specimens for the exhibition stage, for conservatory decoration, or simply grown for producing cut flowers, there are few that equal the Azalea, especially if its excellent constitution and its immunity from disease, when fairly treated, are taken into account. In regard to propagation, taking all things into account, it is better to use grafted plants; some of the stronger-growing varieties will certainly do well on their own roots, but they are not so long-lived, and by far the greater number do much better when grafted. The object in view ought to be to grow them up to something like the size required as quickly as possible; such plants are always more likely to live and bloom satisfactorily than those that have been grown slowly and indifferently, and hence the necessity of having free-growing young plants. On no account commence with such as are at all stunted, either through having been too long in small pots, or having been kept too cold in the winter. We would much rather have a newly-grafted plant, which, with proper treatment, will grow away and far outstrip plants that are stunted, and we prefer those that have a few strong vigorous shoots to those that have had their shoots stopped so as to form close bushy plants.

When they are to be raised from cuttings, these should be put in before the wood gets brown, or near maturity. Shoots in the right condition will usually be obtainable from plants that have flowered and made growth early in spring, by June. Slip them off with a heel and trim the base; put six or eight together in 6-inch pots, filled with sand, kept moist, close, and shaded in an ordinary stove temperature. They will be rooted in seven or eight weeks so as to admit of their being moved singly into little pots; use fine peat and sand, and keep still a little close, with as much warmth as hitherto, so as to get their roots to move freely. Pinch out the points to cause several shoots to break. As the autumn advances give more air and less shade, wintering in a temperature of 45° to 50°. In spring move them into 5-inch pots; when the shoots have grown 3 inches again pinch out the points, keeping the plants in intermediate warmth through the summer. If young grafted plants are required, the stocks—any strong-growing variety—should be raised in the way above advised, except that they should not be stopped, and should be confined to a single shoot, which, if grown on freely as recommended, will be ready for grafting about the beginning of August, when a year old. Select soft bits of stout shoots of the kinds to be grown, remove the lower leaves, and pare the bark and a little of the wood off one side for about an inch; treat the soft part of the top of the stock similarly, so as to fit the edges of the bark of each together, and in this position bind them with worsted. Kept warm, close, moist, and shaded, they will unite in a few weeks, when give more air. Slacken the ties when this is necessary, and remove any growth the stock may make, so as to direct all its energies into the graft, the point of which pinch out to cause it to break several shoots. Whether the plants used are grafted, or from cuttings, the treatment from henceforth will be similar. Do not winter them in a lower temperature than 45° or 50° by night. They will make little or no perceptible progress through the winter months, but so treated they will cast very few leaves, and their roots will be at work; such plants will make more progress the ensuing summer than those that have been starved through the winter will do in two seasons. Towards the beginning of March they will require potting; give them a shift, say into about 7-inch pots; use nothing but good fibrous peat, broken into pieces about the size of acorns, and sufficient silver sand to ensure porosity. After potting keep the house a little close. Through April and May give them a night temperature of 55° to 60°, day 70° to 75°, and syringe regularly overhead every afternoon. Do not stop any shoot, as is often done, unless it is one that is much stronger than the rest; if they run a foot long during the season so much the better, the object being to get a good open framework as a foundation for the future plant, which can be sufficiently filled up afterwards. Through June, July, and August, keep the temperature up to 60° or 65° by night, and 75° to 80° by day, with sun-heat. If they set blooms in the course of the summer nip them out, and they will push a second growth. Discontinue syringing about the end of September, give more air, and reduce the heat both day and night. Keep them on until the end of February at a temperature similar to the preceding year; in the beginning of March give them more heat, and syringe overhead every afternoon as recommended last spring, and as soon as the roots are moving repot into 10 or 11 inch pots, using similar soil and potting hard as before. Let their general treatment all through the summer be the same as the last. Most of the plants will set bloom by midsummer—remove all such and they will push a second growth and set a full crop of buds by the end of September, or middle of October—a month previous to which leave off syringing, give more air and keep the temperature pretty well up, with a drier atmosphere to ripen their buds.

It will now be time to determine what shape the plants are ultimately to be trained to, as there should be a few more sticks used, and they should be trained into something like the shape intended. Any shoots that have a tendency to grow much stronger than others should be tied down so as to bring their points near the base of the plant, which will have the effect of equalising their growth. On no account train them close in specimen fashion, but simply arrange the shoots so as to lay the foundation for the future specimen. Let the winter treatment be considerably cooler than before, 40° or a little under will answer. The plants will bloom nicely, but must not be placed when in flower in a draughty conservatory with a dry atmosphere, for at the time of flowering they will be full of young growth, which would be so hardened by such treatment that it would be difficult to get it to move freely afterwards; and by pushing them forward in a similar temperature, and at the same time, as in the previous season, they will make two growths again during the summer. Pot them this season, as soon as they have flowered, into 13 or 14 inch pots, and let their general treatment be the same as hitherto prescribed.

After this period it will be neither necessary nor advisable to induce them to make more than one growth in a season; consequently they will require to be again wintered cool. A night temperature of 36° to 40° will answer, and the heat must be correspondingly lower in the day. Many growers turn their plants out-of-doors in summer, and this treatment is admissable with such as are forced early, and make their growth correspondingly early in the season, but those that bloom later without forcing are better kept indoors altogether; so managed, they produce flowers larger and finer in colour. Get them tied as early as convenient in the autumn, if possible before their growth has got hard and the bloom-buds ripened, as by so doing the points of the shoots will turn upwards and assume their natural position, which will make them look much better than if they are allowed to harden their shoots before tying, as in that case the wood will be too stiff to right itself in this way. Use no more sticks than are absolutely necessary. Do not tie them in nearly so close as full-grown specimens would require to be; the object for some time yet is to increase their size.

Much has been said and written about the training of Azaleas. We see some collections that are trained on pyramidal circular wire trellises, with every shoot tied and twisted down until the whole surface of the plant is as even as if it were clipped with a pair of shears. Nothing in existence can look more unnatural. In a house full of specimen Azaleas all the plants should be somewhat different in shape, which can easily be done by making some a little wider than others, some higher, others lower over the pots, and others again not so pointed at the top; and all more or less slightly irregular in their outline, by drawing up a branch here and there, and depressing others, so as to form slight protuberances in one place and small hollows in others, yet still the whole surface covered with flowers. This can easily be done by an expert trainer, especially if, as before suggested, the plants are tied while the shoots are soft and yet growing, and these little inequalities will look as if produced naturally. In fact, the principal art in plant-tying is to conceal the art, and to give as much natural appearance as possible, and withal to correct that loose untidy appearance that plants always have when allowed to grow as if they were wild. If they are only required for home decoration they will do with much less tying, but if, on the other hand, they are for exhibition and have long distances to travel, then the shoots must be secured so as to keep them from chafing, or the flowers would be literally ground to pieces.

For producing flowers for cutting the Azalea has few equals ; you may cut with impunity without injuring the health of the plant, but of course plants should be grown for the purpose, as no one would think of cutting their best specimens. We have heard it said that the flowers do not stand well cut out of heat in winter ; the fault arises from two causes—using too much heat, or keeping the plants too far from the light. While being brought into flower they ought to almost touch the glass : so treated the flowers will stand for a week in water or sand and water.

The Azalea is a plant not at all impatient of cold. We have seen plants in a north retarding house in the early spring frozen considerably, and afterwards they flowered quite as well as others that had not been subjected to so low a temperature ; but we should not advise such treatment if at all avoidable, as they might get so far frozen as to injure the roots ; and, as previously stated, this cold treatment induces in young plants a hard stunted condition, to get them out of which takes a considerable time in the spring. In selecting varieties care should be taken to procure such as are not only good free growers, possessing distinct, finely-coloured flowers, but also such sorts as retain their bloom for the longest time. This is a matter that does not receive sufficient attention, yet is of very great importance whether they are required for exhibition or ordinary decorative purposes, some varieties carrying their flowers double the length of time that others will. There is also much difference in the early or late habit of flowering in different kinds ; by a judicious selection the season of their blooming can be much prolonged.

The following kinds can be depended on as worthy of cultivation, and in every way possessing the above qualities :—

A. Apollo. White, striped with carmine, flowers large and of good substance.

A. Baronne de Vriere. Magnificent white, slightly splashed with crimson ; very large flowers.

A. Brilliant. Orange-scarlet ; one of the very best Azaleas in cultivation ; a good grower, and will come into flower after most other varieties are over.

A. Cedo Nulli. Very rich purple, fine in form and colour ; one of the highest coloured varieties grown.

A. Charles de Buck. In the way of Duc de Nassau ; a really splendid variety.

A. Comtesse de Beaufort. Fine bright rose, spotted with maroon ; a magnificent variety.

A. Criterion. A fine old sort ; free grower, profuse flowerer, and very effective.

A. Duc de Nassau. Very large, rosy purple ; a vigorous grower ; one of the best sorts in cultivation.

A. Eclatante. The deepest crimson, shaded rose, and profusely spotted ; one of the very best.

A. Flag of Truce. White ; very fine ; double variety.

A. Flambeau. Deep glowing crimson.

A. Flower of the Day. White, slightly striped with rose ; a fine variety.

A. Iveryana. A fine white ; one of the best, taking all properties into account.

A. Jean Vervaene. Deep salmon colour, edged and striped with white, the upper petals having a dark spot.

A. La Paix. A vigorous, free-growing, telling variety.

A. Louis von Baden. White ; splendid shape ; good habit and profuse flowerer.

A. Madame Ambroise Verschaffelt. A fine effective sort ; ground colour pale-pink, edged with white, flaked and striped with crimson.

A. Madame de Cannart d'Hamale. White, sometimes striped ; a large flower.

A. Madame Joseph Vervaene. Delicate rose, bordered with white, suffused with bright red ; a most desirable variety.

A. Madame Leon Maenhaut. Amaranth, new in colour ; form and habit unexceptionable.

A. Madame Louise de Kerchove. Salmon edged with white ; semi-double.

A. Madame Louis Van Houtte. Splendid white, streaked with rose ; a semi-double sort, of great excellence.

A. Madelaine. Pure white ; flowers large and semi-double.

A. Mademoiselle Marie Van Houtte. White, flaked with salmon ; semi-double.

A. Marquis of Lorne. Very bright red ; a splendid variety.

A. Mars. Splendid bright red, perfect in shape ; a good and vigorous grower, and should be in every collection, however select.

A. Mons. Thibaut. Fine rosy red, distinct, and worth a place in even the most select collection.

A. Roi de Hollande. One of the most

intensely-coloured and profuse flowering sorts grown; ought to be in every collection.

A. Sigismund Rucker. Lilac-rose, bordered and netted with white, bright crimson blotch.

A. sinensis. Orange-yellow; an indispensable old sort, fine and distinct in every way.

A. Souvenir de Madame Rudolph Abel. Salmon, white edge, and crimson blotch; semi-double.

A. Stella. Bright orange-scarlet, with violet centre; a good strong grower, and a profuse flowering variety.

For forcing in the winter season the white sorts are the best; nothing is better than Fielder's White, next to which stands the old White. The Chinese species, A. vittata striata, is a most useful sort for producing cut flowers in the autumn and winter; it comes in without any forcing, lasts for months in succession, and produces freely its beautiful white lilac-striped flowers.

INSECTS.—Thrips are the greatest enemy of Azaleas, and red spider will much injure them; for the destruction of both dip in and syringe with tobacco water, to which is added some gishurst compound; repeat the operation as often as the insects make their appearance. This is better than fumigating, which often injures the leaves, and, so far as red spider is concerned, has no effect.

BABINGTONIA CAMPHOROSMÆ.

This is an evergreen greenhouse shrub that bears pink flowers in autumn. It is not equal to many plants that are from the same country. Swan River.

It is propagated from half-ripened cuttings put in towards the middle of summer, kept close, moist, and shaded in warmth. When rooted pot and treat afterwards similarly to Croweas, which see.

INSECTS.—For aphides and thrips fumigate or dip in tobacco water. Syringe and sponge if the plants are affected with scale.

BALANTIUM CULCITUM.

(Syn.: Dicksonia culcita.)

An evergreen greenhouse Fern, with a stout distinct habit of growth. This plant may be considered worth growing by those who form collections of Ferns, but it is not equal to many kinds. It comes from Madeira.

For propagation and cultivation, see Ferns, general details of culture.

BALSAM.

(Impatiens.)

This is a somewhat numerous genus of plants, the greater portion of which are annuals that, with the exception of the old-fashioned kind so much cultivated for the summer decoration of greenhouses, conservatories, rooms, &c., find little favour with growers. The plant is too well-known to require any remarks further than that those who are commencing to grow it should make sure that they secure a good strain of seed; the poor single-flowered varieties, of which there are so many, require as much attention as the best double blossomed strains, and are so far inferior as not to be worth growing.

The seeds should be sown about the end of March in a shallow pan filled with fine sifted loam, to which has been added some leaf-mould and sand; cover the seeds lightly, and stand in a temperature of 55°, they will come up in a few days, when keep close to the glass. This is important in all the stages of growth, as if the plants get at all drawn they are of little use. Shade slightly from the sun, and as soon as the second pair of leaves appear move singly into 3-in. pots, using soil similar to that in which the seeds were sown; keep a little close until the roots have begun to take to the new soil, and give water as required. Afterwards admit air in the day so as to keep them sturdy; in a few weeks they will require moving into 6 or 7 inch pots, and now use the soil in a more lumpy state, but well enriched with rotten manure —a proportion of one-sixth, with some leaf-mould as well, will not be too much. Syringe overhead every afternoon, and give more air as the season advances, still shading just enough to keep the leaves from being injured. When the soil is moderately full of roots move them into their flowering pots, the size of which should be regulated by the size the plants are intended to be grown to—a 10 or 11 inch pot will support a good-sized plant. After repotting treat as before, and as soon as the roots have had time to get well hold of the soil give manure-water every other time they require watering, still syringing overhead daily in bright weather until the flowers begin to open. Whilst in bloom protect from the full force of the sun, or the flowers will not last so long as they should. It is necessary with these plants to be particularly careful that they never suffer from want of water in all their stages of growth. To keep up a succession, one or two additional sowings should be made at intervals of about a month. Seed is produced much more sparingly by the fine double flowers than by such as are single, yet it is only from the former that seed should be saved, and it should be selected from the flowers on the principal stems of the plants, not from the side branches, the flowers on which are usually semi-double, and yield a much less proportion of seed that will give double flowers.

INSECTS.—Syringe overhead to keep down red spider. Should aphides be troublesome fumigate with tobacco.

BAMBUSA.

A genus of grasses of a highly ornamental description. Some of them attain a gigantic size, such as the stove species B. arundinacea, which, in a house sufficiently high to allow it enough head-room, will reach 50 feet or more in a single season. Several of the smaller growing sorts that can be accommodated in an ordinary greenhouse have a distinct and elegant appearance, their reed-like stems and pretty foliage being extremely effective. Some of the kinds are hardy in the south of the kingdom.

They are increased by division of the crowns or suckers, which most of them produce freely. They should be divided in spring, and the pieces potted singly in pots large enough to accommodate the roots which will be made during the summer. Ordinary loam suits them, with a little sand, and they should have plenty of water when they have begun to grow freely.

B. arundinacea. A majestic-looking plant, forming long, straight, thick stems, which, in their early stages, grow so fast as to make them very interesting on this account alone, independent of their stately appearance when fully matured. It requires a good deal of room, and comes from India.

B. Fortuneii variegata. A prettily variegated kind.

B. nana. A dwarf-growing species, of elegant appearance. The stems are branched and slender; the leaves small and lance-shaped. A pretty kind that does well in a greenhouse. Introduced from Japan.

B. Simonii. A moderately tall-growing sort, with elegant habit. It will thrive out-of-doors, but makes a pretty pot plant. From China.

B. Simonii aurea. A handsome form of the above.

INSECTS.—Both aphides and red spider will live on the plants, but the character of the leaves is such that these insects can easily be kept under by free syringing in the summer.

BANKSIA.

A fine genus of hard-wooded evergreen greenhouse plants, remarkable for their distinct appearance. They were largely grown in times past, but are rarely met with now. There are many species in cultivation, and a selection of the best deserves a place.

They can be raised from seeds or shoot cuttings; the latter, in most cases, will be the most ready way of increasing them. The wood should be nearly matured in autumn before being made into cuttings, which should be taken off at about the third joint, and inserted in pots filled with sand. Cover with a propagating glass, and stand for a time in a greenhouse, after which put them in a moderately warm stove, or pit. When rooted move singly to small pots; good peat, with a liberal addition of sand, suits them. When potted keep moderately close until they get established and have begun to grow, when the usual greenhouse treatment is all that is required. Give larger pots each spring, as more room is needed. Banksias will stand out-of-doors in summer, and are benefited by being thus exposed, providing they are carefully attended to with water, of which they are impatient of having either too much or too little.

B. Caleyi. A large, handsome-leaved species, forming a good sized bush.

B. Cunninghamii. This kind forms a moderately compact bush; the leaves are much smaller than those of the last-named species. The flowers, which are pale yellow, are singular.

B. foliosa. A bold, handsome-leaved species, with a distinct appearance.

B. solandra. A scarce and handsome species, quite different in appearance from any of the preceding; the leaves are distinctly lobed, and terminate so abruptly as to appear as if the extremities had been cut away.

B. speciosa. A remarkable kind, with long, narrow leaves, so deeply lobed as to give it an appearance differing from any other plant we recollect. All the above are from Australia.

INSECTS.—Few insects interfere with these plants, except scale, which, if it gets a footing, increases on them apace; it is best destroyed by sponging, but care should be taken not to disfigure the leaves in the operation.

BEAUCARNEA.

These stately and most singular evergreen greenhouse plants at one time were scarcely to be found, except in the few gardens where uncommon subjects were made a specialty, but since fine-leaved plants have come more prominently into cultivation they are more common, though not by any means plentiful. They are very slow growers, forming straight stems which, like many of the Yuccas, extend and increase in height as they become denuded of leaves. These latter, which exist in the form of a close tuft at the top, are long, narrow, and strap-shaped, recurving and drooping so as to all but hide the stem of the plant, often in the case of B. longifolium more than reaching the ground when the specimen has attained a height of 6 or 8 feet. They form a large protuberance, at the base of the stem, that attains in old specimens the size of a big pumpkin, in which condition a well-grown example, with its leaves 6 or 8 feet in length, is one of the most distinct and effective objects that can be introduced into a greenhouse. They can be raised from seed, but so seldom flower or perfect seeds in this country that, unless foreign seed can be had, it is best to procure young plants. If such are obtained in a small state, say in 6 or 7 inch pots, it will be the work of many years to get them up to large specimens like those above described. To counterbalance this, we may say that, with fair treatment, they seldom get out of health, and are long before they outgrow the limits of even a moderate sized house.

If small plants, similar to those indicated, are procured, most likely they will be better for more root-room; about the end of March turn them out of the pots, and if full of roots give others 3 inches larger. It is necessary with all such subjects as these to be particular about the drainage, as they cannot bear anything approaching a stagnant condition of the soil, which rots their roots. They succeed well in good rich loam, to which is added a good sprinkling of sand; in potting, keep the bulb-like base moderately up above the soil, so as to show the upper part—this adds an additional attraction to the plants; ram the soil quite solid in the pots. Although they will grow with greenhouse treatment, they will, whilst young, progress much faster, and correspondingly sooner make handsome specimens, if they can be accommodated with an intermediate temperature, where the heat all through the growing season can be kept at 60° or 65° in the night, and proportionately warmer in the day. They will also be benefited by syringing overhead daily in the height of the growing season. They are sun-loving plants, and must be stood where they will get a full volume of light, with no shade unless it is found needful to use some to prevent the leaves burning. Give air freely in the daytime and water to the roots, so as to keep the soil well moistened so long as any top growth is going on; in the winter apply only enough to prevent the soil getting over-dry, and keep the heads free from drip or moisture in any way. This is particularly necessary if they are only kept in a greenhouse, in which case the temperature had better not be allowed to fall lower than 45°. A course of treatment, such as here advised for this, the first year, is all that will be found necessary in after time, larger pots being given as required, but re-potting every year is not likely to be necessary even in the early stages of growth, and as the plants get older and large they may often be allowed to go three or four years without additional room. They should, however, by no means be allowed to suffer for want of root-room, especially whilst in their younger stages, as this would defeat the object of getting them up to a handsome size without loss of time.

There are only a few species in cultivation, the following being well-deserving of a place :—

B. glauca. A medium-growing species, with shorter leaves than the others.

B. longifolium. The finest species; the leaves on a well-grown plant attaining a length of 9 or 10 feet.

B. recurvata. A grand plant, with long leaves, of a glossy green colour, tough in texture, and very enduring.

B. stricta. A distinct-looking plant, differing considerably from the preceding.

All are natives of Mexico.

INSECTS.—The hard texture of the foliage of these plants is such as not to invite many insects; if any attack the young leaves, syringe freely with clean water, which repeat as often as necessary.

BEAUFORTIA.

Evergreen flowering greenhouse shrubs of moderate growth, not now much grown, as they are not equal to many that thrive under like treatment. They come from Australia.

They strike from cuttings made of the half-ripened shoots, put in during the summer in moderate heat in sand, kept close, moist, and shaded; when rooted pot off and treat afterwards as advised for Eriostemons, which see.

The two undermentioned will be sufficient for the generality of growers :—

B. gracilis. A slender-growing species of neat habit.

B. purpurea. Bears purple flowers, and blooms in summer.

INSECTS.—Red spider must be kept down by a frequent use of the syringe; should aphides attack the young growth, fumigate.

BEGONIA.

(Fibrous-Rooted.)

Amongst the many flowering stove plants now in cultivation there are few that combine the desirable properties of a long, and almost continuous, habit of blooming, with a freedom of growth that renders them very easy to manage. The well-known character of Begonias in this respect often causes them to suffer from neglect, in a way that precludes the possibility of their true worth being exemplified. This is generally caused by their being grown without sufficient light in dark corners of the stove, under the shade of other plants, whereas they are essentially light-loving subjects, requiring to be kept near the glass with very little shade even in the brightest weather. When the treatment is opposed to this, the leaves get too large, the shoots become unduly elongated, and the natural disposition to flower is reduced. From the day the cuttings are first rooted, they require all the light that a well-constructed house or pit can afford, with a drier condition of the atmosphere than many stove plants need; but as it seldom happens that in private establishments a separate house can be afforded them, or the atmosphere in the matter of moisture be made exactly in keeping with their requirements, the next best course is to stand them as near the glass as they can be got, to shade little, and give them as much air as is consistent with the well-being of other things that may have to be grown along with them. In propagation, as in their after-growth, there is little difficulty, as they will root in a few weeks; they may be struck at any time of the year when a temperature of 60° or 65° can be kept up in the night. If they are put in about the middle of March, there will be plenty of time to grow them into good plants for autumn and winter flowering, during which season they will be found the most useful. The tops of moderately strong shoots make the best cuttings; but, if these are not at hand in sufficient quantities, smaller pieces will do. Cut them to a joint, which retain to form the base of the cutting, with a couple of joints above. Put them singly in 3-inch pots, half filled up with sandy peat, the remainder all sand; do not give much water until roots are formed, but enough to prevent the leaves flagging. From their succulent nature they are, if too wet, liable to rot; and they must not be kept too close under the propagating glasses, or it will have a similar effect upon them. In three weeks or a month they will be well rooted; then remove them altogether from under the propagating glasses, and place them in the lightest place in the house. They should be kept at 65° in the night, and 10° or 15° higher in the day. Move them into pots four inches larger. They do the best in four parts good fibrous loam to one of leaf-mould or rotten dung, with enough sand to allow the water to percolate freely through it; for, although from their quick habit of growth they require an abundance of moisture at the roots, they cannot stand anything approaching stagnant water in the soil. Stop the points of the shoots, to induce them to make bushy growth. Do not shade, except during the middle of the day, in very bright weather. Give plenty of air, admitting it sufficiently early in the morning, but closing so as to economise sun-heat by shutting up whilst the sun is upon the glass, damping the plants slightly overhead at the same time. About the end of July they will need shifting into their blooming pots. The size of these must be regulated by the more or less vigorous habit of the kinds grown. Sorts such as B. manicata will need more root-room than weaker varieties, like B. fuchsioides. Eight or nine inch pots will be large enough for kinds like the latter; the former should have pots ten or twelve inches in diameter. Use soil similar to that which they were last put into, but do not now break it so fine; again pinch out the points of the shoots, if the plants do not appear to be sufficiently furnished, and place a few sticks to train them out so as to admit plenty of light in the centre. Do not give too much water until the roots have got well hold of the soil, and treat in other ways as advised in the earlier part of the summer. By the middle of September they will have grown to a useful size for general purposes. The atmosphere should now be a little drier, and the temperature kept about 60° in the night, and 6° or 8° higher by day. Many of this family will bloom during the summer season, but for the purposes under consideration it is not well to encourage them to do so, as their flowers are of much more service in autumn and winter. Some of the old-established kinds will be found well adapted for use at this season. When the pots are full of roots they will be benefited by occasional applications of manure-water, especially at the time of their flowering. When they have done blooming it is best to destroy the plants, except such as are required to provide cuttings for another year For the latter purpose it is necessary to give them proper attention, for if neglected they do not make shoots suitable for growing on freely. The following sorts will answer well for autumn and winter blooming :—

B cinnabarina. A tall, free-growing kind ; when well managed nearly always in bloom It bears handsome heads of yellow-tinted flowers. From Bolivia.

B. dipetala. One of the freest bloomers of all the species, pink in colour. Bombay.

B. fuchsioides. A small-leaved, tall-growing species, with coral-red flowers, which it produces in profusion from the points of the shoots. New Grenada.

B Griffithii. This is a white-flowered sort, very distinct in character. Introduced from Bhotan.

B. Ingramii. A hybrid with pretty pink flowers

B manicata. A strong-growing species, with large leaves and stout stems. It bears a dense head of handsome, delicate pink flowers, on tall stalks. From Brazil.

B. Prestoniensis. A hybrid variety, of bushy habit, bearing quantities of bright scarlet flowers. A desirable plant.

B. xanthina lazula. A yellow-flowered, very distinct species, from Assam.

INSECTS.—One great recommendation these Begonias have is their immunity from insects, as they rarely are affected with any of the pests that infest stove plants in particular.

BEGONIA.

(Ornamental-leaved.)

When the first fine-leaved Begonias made their appearance they were much prized. Many of the noble variegated plants since introduced were then unknown, and therefore these Begonias for a time engaged much attention. Several of the most effective kinds are hybrids. The different species cross freely, and seedlings are easily raised. The species and varieties that come under the head of the fine-leaved section are mostly from warm latitudes, and consequently require artificial heat in which to grow well; yet several will succeed in a lower temperature than that in which they are often tried. B. Rex, in itself a handsome plant, has been the progenitor of several others both fine and distinct. It comes from Assam, and will do well with less heat than it is frequently supposed to require; this and several others of similar character will succeed in an intermediate Fernery, where their broad distinct silvery-looking leaves contrast effectively with those of the more elegant growing Ferns.

The propagation of most of the kinds is as easy as their after management; they strike freely from cuttings made of the shoots, or from portions of the leaves. The latter is the more usual way of treating them, and is the means by which much the greatest number can be raised from a single plant, as every bit of leaf an inch or so square that contains a portion of the ribs or nerves will strike root and form a plant. The leaves for this purpose should be taken off about May or June, when such as have been formed early in the spring will have been sufficiently solidified to prevent damping off. Take 5 or 6 inch pots drained and partially filled with a mixture of sand and fine peat, the surface made up with sand; in these insert the portions of leaf so that they are one-third below the surface. Give as much water as will just keep the sand damp, but not too wet, or they will be liable to rot; keep them in an ordinary stove temperature, but not covered with a bell-glass, or closely confined in a propagating frame, and do not shade them too much, or they will decay. In a few weeks they will make roots, and begin to form a shoot each that will push up and throw out leaves like an ordinary shoot-cutting. When fairly established, move them singly into small pots in sandy soil—either peat or loam; they usually grow the freest in the former. Although, as we have already said, these Begonias are amongst the easiest of plants to grow, there is a great difference in the appearance of such as are treated in a way that enables them to exhibit their best form and others that are managed the reverse way. The weak-stemmed, flabby-leaved examples often seen are the result of too crowded growth, too much shade, a position too far from the glass, insufficient air and overmuch heat, all of which must be avoided if the plants are expected to fairly represent what can be done with them.

A little shade they must have when the sun is powerful. During the growing season syringe them overhead once a day (the best time is when the air is shut off in the afternoon), and the water should be got as far as possible to the undersides of the leaves, as they are liable to the attacks of thrips. Give water, so as not to let them flag, or the beautiful glossy texture of their leaves, which is the principal thing that makes them effective, will be dimmed. All they need in other respects is to increase the root-room as required. Large specimens will want pots 11 or 12 inches in diameter, but it is not well to give too large a shift at once; rather increase the space as it is needed. They are quick growers, and it is not advisable to keep them until they get very old, as young ones soon attain a size large enough for ordinary purposes. The larger silvery-leaved kinds are most suitable for growing in Ferneries, and will do well planted out in positions that admit of their getting the most light without being too damp.

The undermentioned kinds represent the different forms and colours of leaf that are most distinct and desirable:—

B. argentea hirsuta. Has handsome silvery foliage of medium size.

B. Duchess. Has pale green leaves banded with dark green.

B. *Edouard André.* Has bold distinct foliage clearly marked.

B. Otto Forster. A bronzy green ground coloured kind, marked and streaked with white.

B. Pearl. A prettily marked kind, compact in habit.

B. Rex. Has a bright green ground banded with white.

INSECTS.—These Begonias are little subject to insects. Thrips sometimes establish themselves underneath the leaves, and we have seen red spider attack them, but they can be easily kept down by syringing as already advised.

BEGONIA.

(Tuberous-rooted.)

The present race of these tuberous-rooted Begonias, which now form so conspicuous a feature in many greenhouses and conservatories, have been raised by crossing several species differing considerably in habit. They are of easy cultivation, and being free and continuous bloomers, producing their flowers from every bit of growth made over a good part of the year, have naturally become favourites.

They are increased by seeds, and cuttings made of the shoots. In adopting the former method the seed should be sown in an intermediate temperature early in the year—say about the beginning of February; pots or pans may be used, and should be filled with finely-sifted peat to which some leaf-mould and sand has been added. Press the material moderately firm and make the top smooth; on this scatter the seed thinly, cover very lightly, pressing the surface a little. Stand the pots in a heat of 55° or 60°, and keep the soil just slightly damp; when the young plants appear give a little more water, and place them near the glass. After sufficient growth has been made prick them out in pots or pans, a couple of inches apart; they will grow fast, and must be shaded slightly from the sun in the middle of the day. Give a little air also in the daytime, and keep the atmosphere moderately moist. When leaves an inch or two long have been formed move the little plants singly into 3-in. pots, and as the sun gets powerful give more air and shade, still standing them close to the glass. Keep the night temperature about 60°, with a rise by day proportionate to the state of the weather. These Begonias will grow in either peat or loam, but we prefer the former in their early stages. They will soon want more root-room—6-in. pots will be large enough; give sufficient drainage, and now use good loam mixed with a little leaf-mould and sufficient sand to keep it porous. A greenhouse temperature will now be sufficient night and day; give plenty of air and light, with no more shade than needed to break the sun's rays in very bright weather. So naturally disposed to flower even in a small state are these plants that they will bloom the first season. As the autumn gets advanced give less water, gradually withholding it altogether as the tops die down. If the pots can be laid on their sides, in a pit or greenhouse where no water can reach the soil, in a temperature of about 40°, they will be safe. About the end of February turn the tubers out, shake the old soil away, and give 2-in. larger pots, using good loam prepared as before. If they can now be accommodated with a night temperature of 45° to 50°, with warmth proportionate in the day, they will soon begin to grow, after which give more water to the soil. As the shoots advance put a small stick to each, with a view to tying them out a little, in which way they will be less liable to draw up weakly. As the weather gets warmer a greenhouse temperature night and day will answer, with plenty of air and light and a little shade again when the sun is bright. This summer they will, if all goes well, bloom freely, and be available for conservatory decoration, where they will be found very useful for mixing with other plants, their distinct bright flowers contrasting well with most other things. In autumn again dry them off and winter as before. The tubers will last for several years, increasing in size, requiring larger pots, and bearing proportionately more flowers. When it is desirable to increase any sort by cuttings, these can be made of the shoots in pieces about 3 inches long; inserted in sand, kept moist, moderately close, and shaded in a temperature of 60°, they will root; then pot singly, and treat as advised for the seedlings while at a corresponding size. If desired these Begonias can, when strong, be kept on flowering through a good part of the winter.

Like Gloxinias, Petunias, and some other softwooded plants, the strains of which have been so much improved, there is an almost endless number of good varieties in cultivation.

The following are all fine sorts :—

DOUBLES.

B. Canary Bird. Yellow.
B. Clarinda. Buff, flaked with white, petals edged with pink.
B. Davisi flore-pleno. Crimson-scarlet.
B. Dr. Duke. Bright scarlet.
B. formosa. Carmine, centre white.
B. Francis Buchner. Cerise-red.
B. Gabriel Legros. Sulphur-white.
B. Jules Lequin. Red, shaded salmon-vermilion.
B. Little Gem. Pure white.
B. Madame Truffaut. Orange.
B. Queen of Doubles. Rosy-crimson.
B. Souvenir de Michel Saunders. Bright red, shaded.

SINGLES.

B. Acme. Purple-carmine.
B. Arthur G. Soames. Crimson-scarlet.
B. Ball of Fire. Glowing scarlet.
B. Black Douglas. Rich dark crimson.
B. Charles Baltet. Vermilion.
B. Dr. Masters. Crimson.
B. Empress of India. Yellow.
B. Hon. and Rev. J. T. Boscawen. Deep crimson.
B. J. L. Macfarlane. Deep orange.
B. Lady Hume Campbell. Light pink.
B. Madame Laing. Bright red.
B. Marquis of Bute. Carmine-crimson.
B. Mrs. Dr. Duke. Brilliant purple-cerise.
B. Mrs. J. Freeman. Rose, shaded purplish-violet.
B. Nymph. White, tinted rose.
B. Scarlet Gem. Dark scarlet.
B. Sir Trevor Lawrence. Dark crimson.
B. Snowflake. Pure white.
B. Stanstead Rival. Salmon-red.
B. Sulphur Queen. Sulphur-yellow.

INSECTS. — These Begonias are little troubled by insects; for thrips, which sometimes establish themselves on the undersides of the leaves, syringe freely with clean water.

BERBERIDOPSIS CORALINA.

An evergreen plant with pretty red flowers, sometimes used as a greenhouse climber. From Chili.

It is increased by cuttings struck in spring in moderate heat, and grown on with the usual greenhouse treatment until large enough to plant out, when it should have a well-prepared bed of open peaty soil.

INSECTS.—The plant is subject to red spider, the best means of keeping which in check is a free use of the syringe daily through the growing season.

BERTOLONIA.

These small-growing stove Melastomads almost vie, as regards beauty of leaf-marking, with the most charming of the variegated Orchids. They are natives of the hot countries of the East, and to grow them well and bring out and preserve their leaf-marking a high temperature is required. They are plants of quite a soft-wooded character, and do not grow to a height of more than 6 or 8 inches. They strike freely from cuttings made from shoots in a half-solidified condition. They may be struck at any time when obtainable in that state, but are most likely to be in proper condition in spring. Each cutting should consist of at least a couple of joints. Put them in small pots singly in sand, and cover them with a propagating glass, but do not keep them so close as to cause damp, as soft growth of a nature such as these, if too close and moist, is liable to rot. Give as much water as will prevent flagging, keep in a warm stove temperature, and shade when the sun renders this necessary; they will soon make roots, when they should be given more air, and, as they get established, be removed to larger pots. The soil best suited to them is fibrous peat mixed with some sphagnum, sand, and crocks. A temperature of from 65° to 70° in the night during the growing season, with a rise by day proportionate to the warmth of the weather, will answer; 60° by night, with 5° or 10° more in the day, will do for the winter. Some growers keep the most delicately marked kinds almost wholly covered with a bell-glass, as Anœctochili are sometimes grown, but this treatment makes the plants very soft and tender; yet they do not do well if placed under drying influences, as where much air is admitted. If in a position of this kind, a propagating glass partially closed over them, so as to somewhat confine the air and prevent its getting too dry, will be an advantage. The plants must always be shaded when the sun is at all powerful; they should be stood where a moderate amount of light will reach them, and the soil must never be allowed to get dry. Little root-room will suffice, but, as the shoots are of a semi-procumbent habit, they must have as much space as will allow them to spread. They do well with the pots plunged in a shallow pan filled with a mixture of chopped sphagnum and sand, in which way, if a number of plants are so plunged, they are very effective.

The undermentioned kinds are all handsome:—

B. guttata. From South America; has green ovate leaves, the upper surface spotted with rose. There are three forms of this plant, differing somewhat in the appearance of their leaves, but all handsome.

B. Houtteana. A Belgian variety, most likely of garden origin, with beautiful foliage. Its deeply-ribbed, lustrous, olive-green leaves are spotted with rose; the ribs are marked with rose-tinted hues.

B. margaritacea. A Brazilian plant; has five-nerved ovate leaves, the ground colour olive-green, with lines of white spots, the under surface reddish-purple.

B. primulæflora. This is a species from Ecuador, with ovate-lanceolate leaves, dark-green in colour. It bears very handsome rose-coloured flowers.

B. superbissima. This is also, we believe, a garden variety. It has large, broadly-ovate leaves, in colour dark-green, with large rose-coloured spots within the margin and smaller spots on other portions of the leaf.

INSECTS.—We have found these plants little troubled with insects except aphides, which sometimes affect them; fumigation is the remedy.

BIGNONIA.

(Stove.)

The different species of these plants that require more than a greenhouse temperature to grow them are mostly strong-growing evergreen twiners, suitable for decorating the roofs of large stoves or warm conservatories. They belong to a somewhat numerous family, but only a limited number can be recommended for general cultivation, the habit of many being so rampant as to render them unfit for growing along with other plants. Most of the species usually cultivated should not be planted in a house where a very high temperature is kept up, as the heat and necessarily accompanying moisture render them unmanageable under such conditions, and induces growth to an extent that precludes a disposition to bloom freely. The flowers are produced in panicles, generally during the summer season. They are very effective, especially when the plants are allowed a moderate amount of freedom in their growth—not kept too closely tied in, but allowed to hang in a wavy, natural manner.

One thing should be especially observed in their cultivation, as also in that of other subjects of a similar free habit—that whatever cutting-in becomes necessary during the growing season, to keep them in bounds, should be performed with judgment and due regard to their flowering; this will be best effected by a total removal of such portion of the shoots as is found necessary, but not by a general shortening of the whole. Where the latter is done the effect will generally be to stop blooming altogether, or so far limit the extension of growth as to prevent the production of anything above a meagre display of flowers. So far as possible, it is better to prune after the blooming season is over, as then the flowering shoots are not so much interfered with.

Bignonias may be propagated in different ways—by root-cuttings, layering the shoots, or by cuttings made of young shoots. When they are increased by layers, shoots should be selected that have sprung from near the collar of a plant, and the operation should be performed at a time when the wood has got fairly matured. Procure some 6-inch pots, which drain and fill with three parts peat to one of sand; press down firmly into the pots, and place these on the surface of the border in which the plant is growing. Bring the shoots down to the pots, make a slit in the wood at the under side of the shoot, the knife entering just at the lower side of a joint, and passing upwards longitudinally through it for about an inch. A tongue-shaped piece is thus formed, composed of about half the substance of the shoot; this must be bent down and secured by a small hooked stick in the pot where the incision has been made, covered about an inch deep in the soil, which must be kept watered. In this position it must remain until well-rooted, after which it can be severed immediately below the point where rooted. When root-cuttings are used, pieces about the thickness of a quill should be taken off existing plants early in the spring, before growth has commenced, and cut into bits about an inch in length; insert them singly in thumb pots in a mixture of two-thirds peat to one of sand, with half-an-inch of sand on the surface, leaving the thickest end of the cuttings just a little above the sand; place them in a temperature of 65° or 70° in the night, and a few degrees higher in the day. In a few weeks shoots will be formed from near the top of the cuttings, which will also soon begin to make fibrous roots. Treat them afterwards as with plants grown from cuttings made from the shoots, giving them larger pots as required. When these plants are increased by cuttings made from the young wood in the spring, shoots should be chosen that are not too hard, or, in the opposite extreme, too soft and watery. The former will be slow in rooting, and cannot easily be induced to grow freely; the latter will most likely damp off. Select such as are moderate in strength, and if these can be taken off with a heel, at their junction with the old wood, they will be much more likely to succeed. Put them singly in small pots in sand, confine under a propagating glass in a brisk heat, give moisture and shade; and when rooted gradually inure them to the full air of the house. After they have fairly commenced to grow, give them pots 3 inches larger. They will grow in either loam or peat, but in the first stages peat has some advantages. Use it now broken moderately fine, with one-sixth sand added. Place them in a light situation in a house where the night temperature is kept about 70°, and 10° higher in the day with sun-heat. Shade slightly in very bright weather, giving sufficient air to keep the growth from being drawn up weakly. By the end of July the plants will most likely have filled their pots with roots, and should be at once shifted into others 3 inches larger; at this time half loam should be mixed with the peat. Pot them moderately firm, and place two or three sticks in the pots to train the shoots to; it is better not to stop them, as in most cases a single shoot for a considerable height will be the most suitable form for the plants to assume. Keep them regularly trained round the sticks, not letting the shoots twine round these, or they will most likely suffer when they have to be removed. As the autumn advances give more air, discontinue shading, and reduce the temperature; but do not allow them to get too dry at the roots, as, in common with other evergreen subjects, their leaves will be injured if this occurs.

Winter them in a temperature of 55° or 60°. About the beginning of March they should be planted out where they are intended to remain, as they are naturally too large for pot culture (unless the pots are much larger than either sightly or convenient), and their nature is not such as will admit of partial shaking out and removal of the soil annually.

The border in which they are to be grown should be well drained, as the plants when they get large will require copious waterings. Six inches of broken bricks ought to be placed in the bottom, with a sufficient egress from this for the water. Over the drainage put some fibrous material to prevent it getting clogged up with the soil, which should consist of good loam, with a little rotten manure added, and enough sand to keep it open. The soil should be a foot or 15 inches in depth. When the plants are turned out the roots ought to be carefully loosened from the ball and spread out, covered about 3 or 4 inches, and the soil pressed moderately firm. The shoots should then be trained in the places they are to occupy. As the roots get to growing freely, give water when required, and as soon as the shoots have attained the height where they are desired to branch out, so as to furnish the space they have to fill, the points should be pinched off to cause them to break. Repeat the operation at intervals as they grow, until sufficient exist; these should be regularly trained to wires fixed for the purpose, as, if neglected (especially in their younger stages), they will twine round each other, and become an entangled mass that will require cutting back. During the growing season they will be much benefited by a free use of the syringe every afternoon. When the allotted space is covered the plants should be cut in each season when the flowering is over, after which they will commence to make growth for the ensuing season's blooming. As the soil becomes exhausted each spring, before the roots begin to move, an inch or two should be removed from the border, and replaced with new material; and through the growing season manure-water will be a great assistance.

The following species are deserving of cultivation:—

B. argyrea violescens. A handsome species.

B. aurantiaca. A species of medium growth; flowers yellow. A native of South America.

B. Chamberlaynii. A strong-growing, yellow-flowered kind from Brazil.

B. littoralis. A free-growing, handsome kind from Mexico, producing purple and red flowers.

B. magnifica. A new species of moderate growth; crimson flowers with a purple shade. It comes from the United States of Colombia.

B. ornata. A desirable variety, moderate in growth.

B. purpurea. A stout-growing, very handsome kind, bearing large mauve-coloured flowers, with white centre. Country not known.

B. venusta. An autumn-flowering, orange-coloured kind from South America.

INSECTS.—Bignonias are not much subject to insects. Aphides will sometimes make their appearance on the young growth, but can be destroyed by fumigation. Where the syringe is freely used during the growing season red spider will be kept down. If the plants become affected with scale, it must be removed by sponging, by which means and a free use of the syringe they can be cleansed from mealy bug should this pest affect them.

BIGNONIA.

(Greenhouse.)

The different species here treated of are climbing or twining plants, and are suitable for greenhouse or conservatory decoration, for roof-climbing, for covering back walls, or growing round pillars. So managed their natural habit is seen to advantage, as a portion of their shoots can be allowed to hang in graceful festoons; and grown in this way they are very effective even when not in flower. They can be arranged to drape the wood or ironwork of the building so as to take off the objectionable straight lines without shutting out too much light from the general occupants of the house. This is a matter that cannot be too forcibly impressed upon those who have the charge of plant structures of this description—that where roof-climbers are allowed to form a complete thicket up to the glass, they exclude the light from the plants that occupy the lower stages, so that the latter can only drag out a miserable existence.

Roof-climbers have an elegance that cannot be imparted to ordinary trained pot specimens; but to allow the comparatively few plants that can be accommodated on a roof to monopolise the whole house, so as to render the cultivation of everything else attempted to be grown an impossibility, is as great a mistake as can well be committed. In this as in most other things a medium course is the best; the roof of a conservatory can be sufficiently draped with climbers to answer the purposes required, without making the body of the house a mere living sepulchre for the unfortunate plants placed therein. Subjects for furnishing the roofs in this way can either have their roots kept confined in pots proportionately large to the size of the plant, or, as is more usual, be planted out; the latter system has many advantages, not the least of which is that the plants will last much longer so treated, but the space thus apportioned to the roots should always be sufficiently confined to prevent the plants getting too rampant. Nor should plants intended for growing in this way ever be turned out in beds whilst they are very small; in many cases, unless naturally strong growers, they do not do well, as when the roots are few in quantity they cannot lay hold of the soil before it gets sour, and rarely afterwards do satisfactorily. Therefore if the plants are small it is generally better to grow them on in pots until stronger, and afterwards to put them out.

Climbers are often grown for sale and kept with their roots confined in small pots until they get so stunted as to prevent their growing freely; it is much better to start with such as are young and free in growth than with those that may be larger yet not in so good a condition.

Greenhouse Bignonias can be increased by root cuttings, or layers of the shoots; the former should be made of bits of medium strength, cut into lengths of about an inch, and treated generally as for shoot cuttings. Layering, however, will usually be found the safest way of propagation in private gardens, and it may be carried out at different seasons. If done towards the end of summer, some 6-inch pots should be filled with a mixture of peat, loam, and sand, and such of the current season's shoots as spring sufficiently near the base of the plant to be convenient for operating upon should be layered singly; the joint that is to be inserted in the pot should be notched and secured with a small hooked stick, and covered with soil. Press the soil firmly, and keep it moist; in this way the shoots must remain until well-rooted, which will be during the ensuing summer. Then sever them from the parent plant and keep through the winter in an ordinary greenhouse temperature. They should be potted on in April, and be given a 3-inch shift. All the kinds here treated of will succeed in a mixture of turfy loam and fibrous peat in equal proportions, to which should be added enough sand to keep the whole porous; do not make the soil too fine, and pot moderately firm. In most cases it will be better to confine these Bignonias to a single stem until they have attained a considerable height; consequently they will not require the leading shoot stopped, but should be encouraged to extend in length. For this purpose three or four long sticks should be inserted in each pot, round which the plants ought to be kept regularly trained, but the shoots should not be allowed to twine about them so as to make the work of undoing them difficult. Through the spring and summer encourage growth by syringing overhead every afternoon, and keeping the atmosphere moistened in very bright weather, during which a thin shade will assist them. When the roots get well hold of the soil give them plenty of water and admit air freely, to keep the growth strong; towards the close of summer dispense with shade and the use of the syringe, so as to harden them up. Keep during the autumn and winter in an ordinary greenhouse temperature, with just enough water at the roots to maintain the soil in a medium state of moisture.

Before growth commences in the spring they should be turned out into the border wherein they are to be grown. This ought to be well drained with 5 or 6 inches of broken crocks or pounded bricks, over which some fibrous material from the soil should be placed; on this put 10 or 12 inches of good soil, consisting of a mixture of peat, loam, and sand similar to that already advised. In planting, a portion of the roots, such as are at the outside of the ball, should be loosened and spread out in the border; in this way they will soon begin to grow and occupy it. Syringe them regularly overhead every day all through the growing season; on a free use of the syringe in this way a good deal of success depends, as insects are kept down. All the after-treatment required will be to keep the shoots trained to the wires that are to support them, and, when the space they are intended to fill is covered, to regularly use the knife, so as to keep them in due bounds. In time the soil becomes exhausted; to remedy this, a couple of inches should be taken off the surface each spring without injuring the roots, and its place supplied by new soil, to further assist which liberal applications of manure-water may be given during the growing season.

The following varieties are deserving of cultivation:—

B. capreolata. Flowers scarlet, blooms in June and following months. It comes from North America.

B. grandiflora. Flowers from July to September. This fine species is from Caraccas.

B. speciosa. A pink-flowered plant from Uruguay; blooms in the spring.

B. Tweediana. A yellow-bloomed kind that flowers in the summer. It is from Buenos Ayres.

B. unguis. Orange-coloured flowers; blooms in the autumn. A native of South America.

INSECTS.—Red spider will live upon them, but must be kept under by a free use of the syringe. Scale can be kept down by frequent use of sponge and brush.

BILLBERGIA.

Amongst these South American stove Bromeliaceous plants are some very fine flowering subjects, which, in general habit, partake somewhat of the character of the Pine-apple. As in the Pine, their flower-spikes are emitted from the centre of the plant, but they differ considerably in the forms which they assume; some are quite erect, as in the Thyrse-like Billbergia (B. thyrsoidea), in which the flowers open almost on a level with the intense crimson bracts from which they spring, forming a dense head of splendidly-coloured inflorescence. In others, like the Morel Billbergia (B. Moreliana), the flower-spikes are loose and open in character, and droop elegantly from the centre. Others again, like B. polystachya (the many-spiked Billbergia) have erect spikes, but somewhat branched. All the species are easily grown, being sufficiently similar in their requirements generally to succeed under the same treatment. After they have flowered they throw up suckers from the base. These should not be taken off too soon, as, although they will root when removed in a small state, they nevertheless make much quicker progress upon the plant which has produced them until they get to a moderate size, say one-fourth or one-fifth of that of the parent plant. They will throw out roots at any time of the year, but it is generally best to take them off early in the spring say about the beginning of March, as in that case they have plenty of time to get established before autumn. They should be slipped off from the stools that have produced them just at the point from which they spring; those that are near the soil will most likely have some roots attached, in which case they may at once be placed in pots just large enough to hold them. Others that have not made any roots should have a few of the bottom leaves stripped off and be put in pots, one-fourth filled with drainage.

The soil in which they are grown should be good turfy loam, sand being added to keep it porous; insert the suckers well up to the leaves, pressing the soil down firmly, and do not give any water for some days, or it will make the soil too wet. Place them in a house or pit in which there is a night temperature of 65° or 70°, and 6° or 8° higher in the day; if they can be accommodated with a bottom heat of 80°, they will root quicker than they otherwise would do, but do not confine them in a propagating frame or under glasses, as is done in the case of cuttings, for, if too humid, they are liable to rot. In the course of a month or so they will make roots, and air should be given when required. By midsummer they should be in a fit condition for shifting into pots a size larger than those they are in, but none of the family should be overpotted, as they do not like more soil than the roots can fully occupy. Let them have a light situation, but during summer they will require a thin shade in sunny weather. Supply them regularly with water as it is wanted, and syringe overhead in the afternoons during the season of active growth. Continue this treatment until the beginning of September, when they will not need further shading, and syringing may also be discontinued. The temperature may now be reduced 5° day and night, and by the middle of October it may be allowed to fall to 60° at night. At this point it may be kept throughout the winter, during which they will want less water, but should never be allowed to get too dry. In spring as the days lengthen raise the temperature a few degrees. By the beginning of May the roots will be in an active condition, and the plants should be moved to pots a size larger than those they are in, the soil used being in a similar state to the last potting. If a few bits of crocks or charcoal are added it will ensure the roots keeping healthy, as they dislike anything of a sodden, impervious character. As the season advances increase the temperature to the same height as it was during the previous summer, and give air as before, shading when requisite. This season the plants will, if all goes on well, make strong growth, and some of them may need a second shift in July if the pots are well filled with roots, but unless that is the case do not move them. To such as evidently require more room give pots 2 inches larger, and encourage them to make all the growth possible by giving plenty of heat and light, as the stronger the plants the finer will the flowers be. In autumn reduce the temperature, and treat through the winter as during the preceding one. They will not require repotting in spring, but in everything else they should be managed as already recommended, and they will throw up their bloom-spikes during the spring and summer. When in flower, move them to the coolest end of the stove, or to an intermediate house, if such is available, in which a drier atmosphere is maintained. Thus situated, the flowers will last longer than they otherwise would. When the blooming is over they should be kept in the stove and treated in every way as hitherto, for upon the attention which they get will depend their ability to produce suckers quickly, and in a condition such as will enable them to grow up to a flowering size in the least time. After the first suckers are removed, the old plants, if well cared for, will throw up more, which may either be taken off and rooted singly as already described, or can, if large specimens are wanted, be allowed to remain on the old plants. These if shifted into larger pots and grown on, will make flowering crowns in one season.

The following are a few of the best kinds, which will form an acceptable addition to any collection of stove plants, as even when not in flower they have a distinct and handsome appearance:—

B. Chantinii. A fine species, with bright red bracts. The flowers borne on a stem a foot high, are yellow and red.

B. iridifolia. The Iris-leaved Billbergia is a handsome species, with scarlet and yellow flowers. It comes from Rio Janeiro.

B. Moreliana. Not only one of the best Billbergias, but also one of the most beautiful of the whole of the Bromeliaceous Order. It is a native of Brazil. Its leaves, which grow to a considerable length, have a lively green ground colour, banded with white; its flower-spike is drooping and very graceful; the flowers are crimson-purple.

B. polystachya. Has leaves furnished with strong spines. The spike is erect, the bracts are small and reddish-crimson, the flowers purple. A native of Brazil.

B. roseo-marginata. A strong-growing kind, with long leaves banded with white; the bracts are rose-coloured the flowers light purple.

B. Saundersii. This is a stout-growing species, with strap-shaped leaves 10 or 12 inches in length, spined on the margin, the under-surface being of a purplish colour, and covered with light-coloured blotches. The flowers are produced in half-drooping racemes about 12 inches in length, furnished with long crimson bracts. The calyx is crimson, the corolla deep blue.

and the anthers orange. It has been recently introduced from Bahia.

B. thyrsoidea. Has bright-green leaves, with small spines on their edges, blunt at the point, and slightly reflexed. Bracts rich crimson, forming an oblong, obtuse cone; flowers similar in colour to the bracts, close and erect. From Brazil.

B. vittata amabilis. Of medium growth, leaves stout and banded, flowers pale purple. Brazil.

INSECTS.—Billbergias suffer little from red spider, thrips, or aphides, inasmuch as the hard texture of the leaves does not suit their tastes; but scale, both white and brown, thrive upon them, and must be removed by sponging. Mealy bug will also live on them, and should be destroyed by laying the plants on their sides and syringing with sufficient force to dislodge the insects.

BLANDFORDIA.

In the Blandfordias we have a group of very pretty greenhouse plants, remarkable for their distinct habit of both growth and flower. The foliage is not unlike that of some of the narrow-leaved Irises, and is gracefully recurved. The bloom stems rise erect above the leaves, and bear corymbs of tube-shaped drooping flowers compressed at the extremity. The flowers, in their drooping habit so as to cling close to the stem, assume much of the form of those of Fritillaria (Crown Imperial), the well known hardy spring-flowering perennial.

Blandfordias are plants that do not grow to a large size, and rarely attain a height of more than from 1 to 2 feet. They are summer flowerers, and from their distinct appearance afford a nice contrast to other greenhouse plants.

They are raised from seeds or suckers, which latter are produced in moderate numbers when the plants are strong. Seeds should be sown as soon as ripe in shallow well-drained pans in a mixture of sifted peat, loam, and sand, and should be covered lightly; the pans should be stood in a greenhouse, and the soil kept slightly moistened The seed takes some time to vegetate, and it will be better to let the young plants remain undisturbed until spring; when large enough, prick them out in pans filled with soil similar to that in which the seed was sown, allowing them to stand a couple of inches apart. Place the pans in a light warm greenhouse or pit, giving a little shade in very bright weather. Blandfordias are not plants that require much protection in this way, but in common with most young stock of a like nature they make more progress when not fully exposed to the sun. Here they may remain during the summer, receiving a moderate amount of air through the growing time, with enough water to keep the soil in a fairly moist condition. Winter at about 45° or 50°. Blandfordias will bear a lower temperature than this, but while young they will make more progress when not located in less warmth, and it is well to get them on to a flowering state. In the spring move them singly into 3 or 4 inch pots according to the size they have attained, using soil similar to that which they have hitherto had; treat as in the previous summer. The plants will this season gain strength fast and increase in size. Winter as before, and in the spring give pots from 1 to 3 inches larger as the difference in size requires; now use the soil a little rougher, and pot moderately firm. The strongest examples may be expected to flower this summer, and as soon as the bloom decays cut out the flower stems, and treat until autumn and through the winter as before. In the spring again move them, giving pots from 1 to 2 inches larger according to the progress made, and after this manage as hitherto advised. As the plants increase in size they will form suckers, which, when it is desirable to increase the numbers, may be taken off and placed singly in small pots and kept in a closer atmosphere for a few weeks until the roots begin to move freely. They will progress under like conditions to those advised for the plants raised from seed.

All the undermentioned are handsome flowered kinds:—

B. aurea. Has golden-yellow flowers. It comes from New South Wales.

B. Cunninghamii. A very fine kind, bearing large, deep-red flowers, the extremities yellow. New Holland.

B. flammea. Flowers flame-coloured. Australia.

B flava. A new and very fine large-flowered kind, with the brightest of yellow flowers. New Holland.

B. grandiflora. Flowers crimson. New South Wales.

B. marginata. Copper-coloured flowers, a distinct-looking kind. Australia.

B. princeps. Flowers 2½ inches long, numerous, tube crimson, limb yellow. New South Wales.

INSECTS. — Blandfordias are troubled with few insects, the hard texture of their leaves being distasteful to them. If green-fly attacks the young leaves or flower-buds fumigation is the best remedy.

BLECHNUM.

A moderately handsome genus of Ferns, most of which require warm treatment. A few of them are sufficiently varied in appearance to be worth growing. For propagation and cultivation, see Ferns, general details of culture.

STOVE SPECIES.

B. Braziliense. Brazil.
B. gracile. Brazil.
B. lanceolatum. Brazil.
B. occidentale. Tropical America.

BOMAREA.

These are climbing or twining plants, suitable for training to a pillar, or on the wall of a greenhouse or conservatory. The habit of the plant is to annually produce from the base shoots that come up through the soil like those of Lapagerias, and grow rapidly, producing their large umbellate cymes of flowers from the points of the shoots. The flowers are drooping, bell-shaped, something like those of Lapagerias, but the segments are not reflexed.

Propagation may be effected by division of the roots, or by seed, which latter should be sown as soon as ripe in a mixture of fine peat and sand, be slightly covered and stood in an intermediate temperature. As soon as the seedlings are large enough to handle, move them singly into small pots, using soil similar to that in which the seeds were sown. They should be treated to a temperature that will keep them growing until they get well established, when give them pots an inch or two larger, let them remain in those through the autumn, and winter them in a temperature of 45° or 50°. In spring move into pots 2 or 3 inches larger, according to the strength of the plants. Although Bomareas will grow in a warm greenhouse heat, it is advisable to give them a little more warmth until the end of the second summer; therefore, if means are at command, give them an intermediate heat this season, which will enable them to make much more progress. From the time they are first moved from the cutting pots, give plenty of light with air in the daytime, and syringe overhead in the afternoons while growth continues, keeping them drier in the autumn and winter.

In spring again pot on, as it will in most cases be better to keep them in pots for another season before turning out in a bed or border, where they should ultimately be located so as to receive the requisite root-room; in the following spring move to a bed of this description, well-drained and made of loam, kept porous by the addition of enough sand and broken crocks. From this time nothing further will be required, except to keep the soil fairly moist from the time growth begins in spring until autumn, to give air as required by the other occupants of the house, and to make a free use of the syringe through the summer. The winter temperature may run say from 45° to 48° in the night; in this way the plants will last for many years. There is but a limited number of species in cultivation, and of these the following are desirable :—

B. acutifolia var Ehrenbergiana. Flowers red and yellow, spotted with brown. Mexico.

B. Bogotensis. Petals of a greenish tint, sepals crimson, spotted with black. Bogota.

B. Bredemeryerana. Flowers orange-yellow, spotted with brownish crimson. Venezuela.

B. Carderii. A fine twining species that produces very large heads of flowers, ground colour pink, spotted with brown at the extremities. United States of Colombia.

B. conferta. Flowers bright crimson. United States of Colombia.

B. Shuttleworthii. The flowers of this fine new species are red, yellow and scarlet, spotted with green at the extremities. Most likely it will require a moderate stove heat. Colombia.

INSECTS.—The continuous use of the syringe advised through the growing season will do much to keep down insects, but if this is found insufficient sponging must be resorted to.

BONAPARTEA.

The Bonaparteas are few in number. They are close, compact, yet elegant-habited greenhouse plants, occupying little room, and are exclusively grown for their leaves, which are rush-like in appearance, sharply pointed, and drooping so as to form a dense close mass. Bonaparteas come from the moderately warm regions of America, and consequently do not like being kept very cool in the winter, and as they are very slow growers, taking a number of years to get up to an effective size, it is not well to run any risks by allowing them to be exposed to too low a temperature. If they are injured, the work of years is undone, as their natural formation is such that it takes long for them to recover their wonted appearance. A night temperature of from 45° to 50° in winter is best, with a rise by day proportionate to the weather; in summer they are also benefited by as much warmth as obtainable in a good light house under the full influence of the sun.

They increase freely from seed sown in the early spring, and treated in the ordinary way, with moderate heat and moisture. The seeds, however, except when imported, are seldom within reach of ordinary cultivators, as the plants rarely flower in this country, and seeding is uncertain, even when they do flower. Consequently in beginning their cultivation it is better to procure young plants from those who deal in stock of this description. They are easily grown, requiring comparatively little beyond the ordinary attention in giving water and air in accordance with the active or non-active condition of growth that they may be in. Assuming that the plants are small when obtained, and require more root-room, in the spring give them pots 2 or 3 inches larger, one-fifth filled with drainage material. The soil should be loam of a good description, to which is added a moderate sprinkling of broken crocks and sand. Pot firm, and encourage growth through the spring and summer with an intermediate temperature, if such is at command; if not, give them the warmest place in a greenhouse, or, still better, in a pit close to the glass, in company with other plants that will also be benefited by shutting off the air early in the afternoon. By these means the slow growth of the plants will be accelerated. Give sufficient water while the season of growth continues, to keep the soil in a fairly moist state, but not too wet. An occasional sprinkling overhead while active growth is in progress will assist them. Keep the soil drier through the winter, treating as to temperature as already indicated. Beyond this, all that will be required is to give larger pots as needed, according to the progress that the plants make. They will go on increasing in size for many years, with a consequent improvement in their appearance. They are very suitable for standing in a prominent position in a conservatory, which, if kept, as such structures often are, a little warmer than an ordinary greenhouse, will answer well for them continuously. When the plants get old, if well managed so as to attain strength proportionate, they will flower, but, this is a consummation by no means to be desired, as after this, if they do not die down altogether like most species of a kindred nature and habit, their symmetrical appearance is injured. When a plant happens to flower, the blooming sometimes causes the production of young offshoots from the stem. These, if allowed to remain until they have got strength enough, and then taken off and inserted singly in small pots in soil of a like description to that advised for established plants, and treated in the way of ordinary suckers as to keeping moderately warm and close, but not too moist, will root and make plants which will require to be managed subsequently as recommended for established plants in the early stages of growth.

B. juncea. Has smooth, bright-green, almost cylindrical leaves, half-an-inch in diameter a little above the base, tapering gradually towards the extremities, and ending in a sharp point; they droop straight down so as to cling close to the stem in a dense mass, and are long-enduring.

B. juncea filamentosa. A very distinct form of the above, the leaves of which throw off a profusion of long filament-like threads, white in colour, giving the whole plant a singular and interesting appearance.

INSECTS.—Bonaparteas are little troubled with insects. Scale may possibly attack them, and can best be removed by sponging.

BORONIA.

These plants, which are indigenous to New Holland and New South Wales, are evergreen greenhouse shrubs of small or moderate growth, flower most profusely, and continue in bloom for a very long time. When in good robust health some of the kinds will frequently begin to open their flowers in January and February, and remain without interruption for three or four months clothed with their small shell-like pinkish-lilac and red blossoms. The general appearance of the plants in or out of flower is pleasing, they being devoid of that stiff upright habit which many hard-wooded shrubs possess. They are also less liable to get in bad condition at the roots than many greenhouse plants, and with good treatment are moderately fast growers, continuing to flower freely and regularly for a number of years. They are alike suitable for exhibition and for home decoration. Being free rooters, in their early stages they should never be allowed to suffer for pot-room, for if they do it is a difficult matter to get them to move freely afterwards. They are usually grafted, but will do equally well on their own roots, although many growers prefer grafted plants; we have had them both ways, but never could see sufficient difference to warrant preference. They succeed best in good peat, not necessarily as fibrous as that required by some more delicate-rooted plants; use one sixth or seventh part of sand, according to the description of the peat, which for plants, say in 6-inch pots, should be broken in pieces about the size of broad Beans, and well-mixed with the sand.

All the Boronias can be propagated from cuttings made of the points of the shoots about two or three inches long, taken off in August when the growth is about three parts matured; put them an inch or two apart in 5 or 6 inch pots filled with sand, and keep them covered, moist, and shaded in an intermediate temperature; in this way they will root in a couple of months, when gradually remove the glasses, and keep them through the winter at about 45° in the night. Move singly early in the spring into 2 or 3 inch pots, according to the strength of the species, using good peat broken fine, with sand as requisite to keep it open. Pinch out the points of the shoots at the time of potting, and keep them a little warmer and closer through the spring and summer than larger greenhouse stock require to be. The stronger growing sorts will most likely bear moving into pots two inches larger by the middle of July. In very hot weather keep the material on which they stand a little moist; let them have plenty of light, but shade slightly all through the summer when the sun is powerful, stopping the strongest shoots when necessary. Give more air in autumn, and winter as before.

If the plants show signs of growth by the middle of March, move them into pots 2 or 3 inches larger, according to the amount of roots they are found to have; and give ample drainage, so as to ensure the soil continuing sweet. Pot firmly, tying the branches well out at the same time, as the sticks can now be put into the new soil without coming in contact with roots. After potting, place them in a house or pit where they can receive a night temperature of 45°, and give no side air for some three or four weeks. Keep the stage on which they stand sprinkled with water in bright weather; but if potted at this early season they will not require shading, as their small leaves do not lose so much by evaporation as plants with more ample foliage. If the plants take freely to the new soil they will make good growth, and by the middle of May will require the points of any shoots that are taking the lead to be pinched out. Do not defer this operation too long, for it necessitates such shoots being shortened back further, which is simply a waste of strength. Treat as last summer until the beginning of August, after which discontinue the closing and syringing, leaving the top air on all night. At the middle of the month turn them out of doors for a time to ripen their growth. They are plants much subject to mildew, and, unless they receive this open-air treatment, will be difficult to manage through the winter. This exposure to the open air applies to all the varieties except B. serrulata, which should never be fully exposed, as its foliage is liable to burn and turn yellow if so treated. By the middle of September remove the plants to their winter quarters, which should be in a good light house near the glass, with a similar temperature to that before recommended. Give less water during the short days and comparative rest of the plants, but they must never be allowed to get too dry, or their leaves will suffer. Repot again about the same time as recommended the first season, using soil of similar description, but not so finely broken. If the plants have made plenty of roots, give them pots 4 inches larger; treat them as to air, the use of the syringe, and the early closing of the house, as recommended for last year in every way. Stop any shoots running away too vigorously, and tie well out, keeping the more vigorous branches well to the outside of the plants, which will go far towards balancing any over-strong growth. Give them a few weeks' exposure in the open air before transferring them to their winter quarters in the middle of September. By the following spring they will be nice young specimens, and be useful for conservatory decoration. They should there be placed where they will receive as much light as possible, and not be too much crowded with other things. After flowering give them another pot 2 inches larger, and they will then for a short time require a little shade, consequent upon this potting being later in the season. Treat in other respects as in the summer before. By the autumn the plants, if all is well, will be handsome half specimens, and after blooming the following spring will require another shift. They do not require cutting back, neither do they well bear the operation, but care in training obviates any necessity for using the knife.

The following varieties are distinct, and worthy of a place in any collection:—

B. Drummondii. A slender-growing plant, and a free bloomer.

B. elatior. A newer and beautiful species, with bright reddish-crimson flowers, produced in the greatest profusion, and very enduring.

B. megastigma. A very distinct kind. The flowers are brownish-purple outside, and yellow within; powerfully but agreeably perfumed.

B. pinnata. This is the best of the Boronias, as well as one of the most desirable plants in cultivation. It is a good grower, flowers freely, and with good treatment will last for many years. We have seen a plant of this variety in a 15-inch pot for seven years, flowering every season regularly, and in as good and healthy a condition at the end of that time as it was at the commencement.

B. serrulata. This is a smaller-growing different-habited plant, flowering altogether from the points of the shoots. It has bright-coloured flowers, highly fragrant, a small plant being sufficient to perfume a plant-house or large exhibition tent. It flowers usually in April, May, and June, lasting eight weeks in bloom.

INSECTS.—They are all subject to brown scale and aphides, their small leaves rendering it difficult to remove the former insect. The best remedy is to wash them all over with insecticide, laying the plants down on their sides during the operation, which should be done as soon as they show signs of completing their growth, before the flowers show prominently, otherwise the washing may cause them to drop off. For aphides fumigation is the best course to follow, smoking them two or three times at intervals of ten days. They are more or less subject to mildew at all times of the year, but especially during the winter and spring, particularly if kept in too low a temperature. They must be looked over often, and sulphur carefully applied as soon as the least trace of the parasite is discovered, for, if neglected, they will quickly lose quantities of their leaves, and this has a serious effect upon the roots. Allow the sulphur to remain on three or four days, then syringe clean off, being careful that none gets into the soil, or it will endanger the health of the plants.

BOUGAINVILLEA.

These are amongst the very finest stove plants in cultivation, especially for covering a back wall or training on a roof, where, if the long drooping branches are allowed sufficient freedom, they have a charming effect; when well managed they are scarcely surpassed by any plants in cultivation. B. glabra is the freest-flowering of all the species, blooming well even in a small state, and when it has room enough to attain a considerable size it will keep on for most of the summer. It is the best of the family for pot culture, to which purpose it is particularly adapted, either for the decoration of the stove or for the exhibition stage. A description of the growth and flowers of this species (which, for its general properties, is the best to grow) will suffice for the others, as they only differ, so far as the purposes of cultivation are concerned, in the strength of growth and depth of colour in the flowers. Bougainvilleas are very distinct from all other cultivated plants, especially in the general appearance of the flowers. These are somewhat small and inconspicuous, in form not unlike the individual florets in a Lantana; they are inclosed in large bracts, which, while small, when they first appear, are green, almost the colour of the leaves. As they approach their full size, about an inch and a half in length by an inch in breadth, they, however, assume a beautiful pale mauve colour which lasts with little change for several weeks, the strong shoots producing a succession opening for a considerable time. As fresh growth is made through the summer, the flowering is prolonged with little interruption until autumn, especially when the plants are grown in a brisk heat. There is one peculiarity about the species, that it will flower profusely in a cool intermediate house when planted out, but rarely makes much bloom when its roots are confined in a pot, unless it is grown in a higher temperature. It also gives a much longer succession of flowers when in a warmer situation. The flowers of all the species have few equals when cut for filling large vases; they are equally suitable for bouquets, lasting longer, with little or no moisture to support them, than most things. They are all strong growers, and require a considerable amount of root-room to enable them to make growth sufficiently to show their true character; they will thrive in either peat or loam, but the latter appears to suit them best, as it does not so soon become exhausted.

B. glabra does not require a long rest in winter, and may be started early in the year. From plants so treated cuttings may generally be obtained by the beginning of March. These should be taken off with a heel as soon as they are 6 inches long, and inserted singly in small pots filled with three parts fine loam to one of sand, with a little drainage; cover with a propagating glass, and place in a night temperature of 70°, allowing it to rise 8° or 10° with sun-heat. Keep moist and shade from the sun; they will root in a few weeks, when they may be moved into 6 or 7 inch pots, mixing one-fifth rotten manure with the loam, and as much sand as will keep the soil sufficiently open to allow the water to pass freely through it. After the plants get fairly established in the new soil they will need very little shade, but must have plenty of water. Syringe overhead in the afternoons, and raise the temperature 5°; by the middle of May pinch out the points to induce them to form several shoots. About midsummer they will, if all goes well, have filled their pots with roots, and should be moved into others 9 or 10 inches in diameter. Now use soil in a more lumpy state than when the plants were smaller, and add a similar quantity of rotten manure and sand. Place four or five sticks 4 ft. in height in the soil just inside the rims of the pots, round these train the shoots, tying them loosely, so as to give the requisite support and keep them from getting entangled. Give air early in the day through the spring and summer when the temperature of the house runs up to 80°; but close in the afternoons with the sun upon the glass, and continue to syringe overhead, and give plenty of water to the roots as soon as they have got well hold of the soil. This Bougainvillea is naturally so free in flowering that the plants will no doubt bloom in this stage of their growth; but, if the object is to grow them on to a large size, it will not be advisable to remove them when in flower to a conservatory, or similar cooler house, as that would retard their progress. If, on the contrary, small-sized decorative plants are deemed the most desirable, they can be placed in a cooler situation during the summer months, but when used for such purposes this Bougainvillea requires such treatment as few plants would bear.

When the flowers are about half-grown, and before they have begun to colour much, the plants should be removed to the cooler house in which they are to remain when in bloom, for, if allowed to stay in strong heat until the flowers are fully matured, the check they receive in that state generally causes them to fall off in a few days after removal, whereas if they are moved while the flowers are growing, they will not only come to maturity, but last twice as long—often five or six weeks—as in a high temperature; the colour is also many shades deeper. Yet it is not advisable to allow the plants to remain in too low a temperature too late in the season. By the middle of September, at the furthest, they should be returned to the stove, being likely to suffer if the night temperature of the house drops below 48°. When replaced in the stove, no more growth should be encouraged during the autumn, as there would be difficulty in getting it ripened up before winter. To prevent this, water should be withheld until the plants flag considerably, and then a little only should be given to freshen them up. Do not fully moisten the ball, and gradually dry them off in this way until only enough moisture exists in the soil to prevent its becoming absolutely so dry as to endanger the roots. Keep them in this state during the closing months of the year in a night temperature of 55°, with 5° more in the day. Where it is wished to extend the flowering as far as possible, they may be started early in January, the temperature raised 10° day and night, and all the weakest shoots not strong enough to produce flowering wood cut out; at the same time turn them out of the pots, remove any loose soil not occupied by roots, and afterwards place the ball in a pail of tepid water for eight or ten hours, so that it may get soaked right through; otherwise difficulty will be found in getting it properly moistened, without which the growth will be weak. After this immersion return the plants to the stove for a day to allow the soil to drain, and then put them in the pots they are to remain in for the season.

If they are not required much larger than the size they attained the previous year, they need not have pots above 3 or 4 inches larger than they have already occupied; soil similar to that they have hitherto been in, but with a little more manure in it, should be used. They should now be trained on wire trellises proportionate to the size they are intended to be grown to, and syringed every afternoon. In three weeks they will push young shoots, which will grow fast, and should, as they extend, be kept tied in an upright position, for if allowed to hang down their free extension is stopped and they are induced to break back, which causes them to flower more sparingly by diverting the sap so as to prevent their getting so strong as desirable. As the roots begin to grow freely give plenty of water, for if ever the young shoots, after they have made considerable progress, are allowed to flag through insufficiency of moisture, they will stop growing and set flowers, but in much fewer numbers than if the growth had been stronger before they were formed. By the middle of March, as the sun gets more powerful, raise the temperature 5° in the night, allowing it to run up to 80° before giving air, and keep the plants well up to the glass. Bougainvilleas do not require shading from the sun, the flowers being more highly coloured when exposed to its full influence. About the beginning of April the plants should be in bloom, but at this early season ought not to be removed to a cooler house. If the flower shoots are trained down round the trellis the plants will push up more growth, to assist which manure-water should be liberally given every other time they are watered; when again showing flower the plants can be placed in a cooler situation, and so prepared to stand a lower temperature when in bloom, as during the previous summer. Afterwards they can again be hardened off and wintered as before. If large specimens are wanted, they should at the spring potting, instead of being placed in the smaller pots as advised, have more root-room, pots 18-in. diameter, with larger trellises to train them on, and in other respects be treated as recommended for the smaller plants. They will last for several years so managed; each spring about half the old soil should be removed, the roots cut back proportionately at the time of re-potting, and the plants supplied liberally with manure-water during the season of active growth; at this time they will bear its application every other day.

B. glabra. Equally suitable for planting out in either a warm stove or an intermediate house. When so used it should be grown in a pot the first season, and the shoots not stopped until they have attained a length proportionate to the place they are to occupy. The border it is planted in should be well prepared by being properly drained, and should consist of 12 inches deep of good soil, similar in character to that advised for pot-culture. The plant, on account of its free-growing disposition, quickly exhausts the soil, and consequently it will need as much removed each spring before growth commences as can be got away without too much interference with the roots; replace it with new, at the same time cutting back the head of the plant as it may require, but in the growing season do not keep the branches too closely tied in—a loose, free disposition of them being the most effective. When planted out it should not have much water in the winter.

B. speciosa and *B. spectabilis.* Are both more suitable for planting out than pot culture, being stronger growers than the preceding. B. spectabilis is a grand plant for this purpose, succeeding better in the temperature of an intermediate house than when grown hotter. The treatment it requires is similar to that of B. glabra, and it especially needs a free use of the knife each spring after flowering—not before it blooms, as in the case of B. glabra; the same observation applies to B. speciosa. When it has got large enough to fill the space allotted to it, remove the weakest wood. The room allowed for the roots should in all cases be proportionate to the space the heads of the plants are intended to occupy; never give too much soil, otherwise, being naturally such free-growing subjects, it becomes difficult to keep them within bounds.

INSECTS.—Bougainvilleas are subject to the attacks of aphides, thrips, and red spider. The two first can be destroyed by fumigation with tobacco smoke; the last can be kept under by a free use of the syringe. If scale or mealy bug affect them, diligent use of the sponge and copious syringing must be resorted to, washing the plants, when cut back in the spring, with insecticide.

BOUVARDIA.

These rank among the freest-flowering evergreen plants that we possess, and in all but continuous habit of blooming they have few equals. The flowers are alike effective on the plants, or when used in a cut state, for which purpose their simple form and the purity of their colours befit them. Another property which they possess is their ability to bloom in the smallest state, when not more than a few inches high.

They are natives of Mexico, and, like a good many others that hail from the same country, they will live under a considerable range of temperature, varying from that of a greenhouse, or even of the open air in the summer, to a warm stove in winter. To the latter, with a view to get them to produce the largest quantity of flowers of which well-prepared plants are capable, it is necessary to subject them, as under such conditions they keep on making new shoots that yield flowers in a way not possible when the plants are kept in a temperature only sufficient to induce the flowers to open. Bouvardias have been long known to some extent by plant growers in this country, but it is only within comparatively recent years that their merits have been understood. So indispensable are they where enduring flowers are required continuously through the winter, that no garden where there is the requisite means for blooming them should be without them. In the United States much improvement has been effected by raising new varieties, which have all but superseded the kinds first known to us.

At one time much difficulty existed in propagating them in the ordinary way from cuttings made of the shoots, and their increase was generally effected by cuttings of the roots. But a method of preparing the plants to produce cuttings that root without difficulty has been hit upon. To have the plants in a condition strong enough to flower well in the autumn and winter, it is necessary to begin in the last months of the year previous, say about the middle of October. Then select a few plants of the different sorts grown, these place where an ordinary greenhouse temperature is kept up of about 40°; give no water to them, but allow the leaves and soft tops of the shoots to flag freely. When most of the leaves have shrivelled up, remove all the soft immature points of the shoots, cutting them back into the hard wood; moisten the soil well and place them in a temperature of about 60° in the night, with a proportionate rise in the day. Here they will break freely from most of the joints, and when the young shoots have grown to a length of about two inches they must be taken off at the base, whence they have sprung from the mature wood. Insert them closely in 5 or 6 inch pots, in sand, in the way Fuchsia cuttings are treated, and put them in a temperature of 65° or 70°, where, kept close and moist, they will root in a few weeks. Then move them singly into small pots, filled with a mixture of sifted loam, three-parts to one of leaf-mould and a little rotten manure, with sand as required. Keep them at a temperature similar to that in which they have been struck; as soon as they begin to grow give them plenty of light to prevent their being drawn, and when they have made an inch or so of growth, pinch out the points of the shoots. Keep the soil fairly moist and they will move freely; in a few weeks, say by the end of March, they will require stopping again. It is necessary to attend to this pinching out of the points, otherwise the plants will not be furnished with enough shoots low down so as to make them bushy, as they should be to look well. They will bear keeping up to 65° or 70° in the night by the end of April, and 10° higher in the day with sun-heat. They will require a thin shade when the days are bright, but must be stood near the glass where they will get plenty of light. If not, kept thus warm the growth will be weak and spindly. By the end of May move them into the pots in which they are to be grown in and flowered, and again pinch out the extremities of the shoots. As soon as they begin to move freely, give more air, keeping the roots well moistened, and still shading as far as found requisite. From the beginning of April all through the growing season they should be syringed every afternoon. In July each of the principal shoots should be tied out to a thin stick, which will give the necessary support; any that show bloom during the next five or six weeks (unless flowers are wanted early) should have them pinched out or they will come in too soon. Give plenty of air through August and September, and up to the middle of September, if the plants have attained size enough, they may with advantage occupy a pit where the lights can be taken off in the daytime; this will strengthen them much. They will set flowers freely, which will open in October with no more heat than requisite to prevent their being too cold in the nights or when the weather is chilly in the day; but after this time, if the flowers are expected to come up to their full size, and the white kinds pure in colour, they should have heat, increased as the external temperature lowers.

The most successful growers keep the plants they want for blooming about Christmas, and during the three following months in a brisk stove heat; but under such conditions they must be close up to the roof glass in a light house or pit. It is necessary to regulate the supply of flowers by keeping some of the stock cooler, so as to be brought on at two or three intervals in succession. When well managed the pots get full of roots, and it will much benefit the plants if supplied once or twice a week with manure-water during the time they are being brought into flower. By this means they will continue to throw up strong successional flowers for a couple of months at least.

In place of growing them through the summer in pots as already described, it is a good plan, where there happens to be a low light pit at liberty where they will be well up to the glass, to plant them out about the time that has been advised for their final potting. When so treated, they should be put in, 15 inches apart, in good soil, and with the requisite attention they will attain double the size that they do in pots, and give proportionately more flowers. Where this course is followed, they should be taken up about the middle of September with good balls, put in 8 or 9 inch pots, and kept a little close for two or three weeks: in this way they make very strong shoots, which bloom profusely, and keep on in succession longer than pot-grown plants. In spring such of the old plants as may be required for a second season should be cut close in, as soon as they have broken into growth shaken out and re-potted in new soil, and treated through the summer as advised for the young stock. More root-room, however, should be given, and so managed, and well attended to, they make larger plants that flower abundantly. In this way, being annually cut back, they may be grown to a large size, but for general use smaller examples are preferable, and in most cases it will be found best to propagate fresh stock either all or in part yearly. The following are all fine kinds :—

B. Alfred Neuner. A double variety, with pure white flowers, produced freely.

B. candidissima. A pure white kind. Very sweet scented.

B. Dazzler. Intense scarlet, a fine variety.

B. elegans. Scarlet, brighter than B. Hogarth.

B. flavescens. Flowers pale yellow.

B. Hogarth. Scarlet, makes large trusses.

B. Humboldtii corymbiflora. Pure white; very sweet scented. The largest-flowered kind.

B. jasminoides longiflora. Pure white; a free grower.

B. longiflora. Pure white; a large-flowered sort.

B. President Garfield. A distinct, handsome, pale pink, double variety. A. sport from B. Alfred Neuner.

B. Vreelandii. A dwarf-growing, profuse-flowering, white kind.

INSECTS.—Thrips are easily kept down by the regular syringing that the plants should have through the growing season. If scale or mealy bug happens to trouble them, they must be kept under by sponging and syringing freely with tepid water; all affected plants should be discarded after they have flowered, and propagation effected from clean stock.

BRACHYSEMA.

Evergreen greenhouse climbers, possessing some merit, but not often met with. They are increased by seeds: the method of sowing and the subsequent treatment should be as advised for Bomareas, which see. They may also be propagated by layers.

The following are the most effective kinds :—

B. acuminata. Flowers red, a spring bloomer. From the Swan River.

B. hybrida. A hybrid variety with crimson flowers; blooms in the spring.

B. latifolia. Flowers crimson, produced in spring. From New Holland.

BRAHEA.

A small genus of stove Palms that attain a moderate size; several of the species are sufficiently distinct from those belonging to other genera to make them desirable.

For propagation and cultivation, see Palms, general details of culture.

B. filamentosa. This species forms quantities of thread-like filaments on the leaves, which give it a decidedly remarkable appearance. It comes from California.

B. nitida. A handsome species, with moderate-sized leaves, it is not a very fast grower, neither does it require so much head-room as most kinds. South America.

BRAINEA INSIGNIS.

This, which appears to be the only known species of this genus of Ferns, is a very desirable stove kind, and should be much more generally cultivated than at present. It is a dwarf Tree species forming a moderate-sized head on a comparatively short well-proportioned stem. In appearance it comes nearest to some of the Lomarias, such as L. cycadifolia. Introduced from Hong-Kong.

For propagation and cultivation, see Ferns, general details of culture.

BREXIA.

These are stove plants that grow to the size of small trees, but since fine-leaved subjects came so much into fashion one or two of them have been cultivated for their handsome foliage. They can be struck from cuttings and grown on in the way advised for Theophrastas, which see. Their leaves are distinct and handsome.

The following are worth a place where room is not limited :—

B. chrysophylla. An evergreen species from the Mauritius.

B. spinosa. A distinct evergreen kind from Madagascar.

BRUGMANSIA.

Amongst flowering greenhouse plants that grow to a large size the Brugmansias stand conspicuous. Strong and vigorous in habit they require a considerable amount of root-room unless the object is to restrict their size, a course of treatment to which they submit better then most plants that grow large naturally. They produce large funnel-shaped flowers varying in colour from the white B. Knightii to B. bicolor, the flowers of which are sanguine red. They can be grown so as to bloom well in pots or tubs, but they are seen to advantage when planted out so as to form a standard, or, still better, where there is room for the growth to extend, as at the end of a large greenhouse or conservatory where the light they get through the glass to which the shoots are in close contact matures the wood and induces the freest disposition to bloom. If in such a position provision can be made to plant them in an outside border as vines are usually planted, taking the stems inside, low down, and there is enough room for the head to extend, the effect they produce when covered with their large flowers is very fine. Brugmansias increase freely from cuttings made of the points of the shoots about three or four inches long taken off in spring. They should be put singly in small pots filled with sand and loam, and placed in heat, where they make roots in a few weeks. Then they should be moved into pots two or three sizes larger, with good ordinary loamy soil, to which a moderate quantity of rotten manure is added. After the plants get to growing freely treat in every way as for ordinary greenhouse stock, giving a moderate amount of air in the day with plenty of water and a free use of the syringe daily through the growing season. By the end of June they should have made enough progress to require moving into 8 or 10 inch pots. The usual way of growing them is in the form of small standards on stems from 4 to 5 feet in height: the first season the growth should be directed so as to form this erect stem, and to get them up to a handsome size without loss of time. In the autumn when growth has ceased give less water, using no more through the winter than is sufficient to keep the soil from getting quite dry; during this time warmth such as is kept up in an ordinary greenhouse will suffice. About the beginning of March turn them out, remove all the loose soil, and put them in 12 or 13 inch pots, cutting the point of the stem back to induce their breaking several shoots so as to form a head. When they push into growth remove such shoots as are not well placed. Keep the plants in a greenhouse through the spring and summer with plenty of light and air, syringing overhead daily; they may be expected to flower about the beginning of August and September, when they can be placed in a conservatory, where they will be attractive for some weeks. Brugmansias are gross feeders and must have plenty of water whilst growing, and during the time they are in flower. Through the winter treat as before; each spring turn them out of the pots, reduce as much of the ball as can be done without disturbing the roots, replace it with new, and give larger pots or tubs as the plants increase in size. Every spring before growth begins the branches should be well cut in so as to keep the heads within a size proportionate to the place they are to occupy. When they are to be planted out it is better to grow them for the first year in pots, turning them out the following spring before growth begins, and cutting back the stem to induce the formation of shoots. These latter must subsequently be stopped and trained as required to furnish the space destined to be covered.

The undermentioned are all fine kinds:—

B. bicolor. Flowers red; a large grower. Peru.

B. floribunda. Orange-coloured flowers. South America.

B. Knightii. A very handsome white flowered kind.

B. suaveolens. Has immense, drooping, white, trumpet-shaped flowers, which it produces freely. A native of Peru.

B. Waymanii. A dwarf-growing, white and purple flowered kind. From South America.

INSECTS.—Red spider, aphides, and most of the other leaf parasites that prey on plants, will thrive on Brugmansias, much will be done to keep red spider and aphides down by the regular syringing already advised. If mealy bug or scale make their appearance, sponge and wash with insecticide.

BROWNEA.

These are among the finest of all evergreen stove shrubs. One of the finest of the species, however (B. Ariza), attains the height of a moderate-sized tree. Their large dense heads of flower are almost equal in size to the trusses of the finest of the Rhododendrons; they are only suitable for a large house, where they have room to show their true character They may be grown in large pots or tubs, but are better turned out in a prepared bed. They succeed in a mixture of half peat and loam of a good turfy nature.

Cuttings of the current season's shoots, in a nearly mature condition, put singly in small pots filled with sand, in autumn, and kept moderately close and moist in a temperature of about 60°, will callus over, and make roots during the winter. When well rooted, remove the glasses, and stand near the light. In spring increase the heat in the night to 65°, letting it rise proportionately more in the daytime. The plants should now be moved to larger pots, and as the sun gets powerful shade in the middle of the day, giving air at the same time. Syringe overhead in the evenings. Continue to treat thus until the autumn, when lower the temperature by night to 60°, at which keep them through the winter. Give larger pots in spring; the plants, if all has gone well, will

BRUGMANSIA ARBOREA. *To face page 82.*

bear a liberal shift; manage afterwards as advised for the preceding summer. It will take several years to get them up to a large blooming state, during which time they must be well supplied with root-room, either by giving larger pots, or still better, by turning them out in a bed. In either case, they will last in a healthy state for some years, but, if in pots or tubs, they must be regularly attended to during the growing season with manure-water.

The following are the most desirable kinds:—

B. Ariza. The largest grower; it bears splendid large heads of deep crimson flowers, which open early in summer. A native of Bogota.

B. coccinea. A West Indian species, with bright scarlet flowers. A summer bloomer.

B. erecta. A scarlet-flowered kind from South America.

B. grandiceps. This bears conspicuous large heads of bloom, red in colour. From the Caraccas.

INSECTS.—The large leaves of these Browneas do not offer much shelter for insects; a regular use of the syringe through the growing season will usually be found sufficient to keep them clean.

BRUNSFELSIA.

Evergreen stove plants of neat habit. Their flowers are distinct in appearance, and produced in sufficient quantities to make them attractive; yet they appear to be now little thought of by plant growers, as they are rarely seen. They can be propagated, and grown on under conditions such as advised for Tabernœmontanas, which see.

The following are pretty kinds:—

B. americana. Flowers yellow, produced early in summer. A native of the West Indies.

B. americana augustifolia. This also has yellow flowers; it blooms a little later than the type species. From the West Indies.

B. undulata. A white-flowered species that blooms in summer. A native of Jamaica.

BULBS FOR FORCING.

The different kinds of bulbs that are used for forcing play an important part in greenhouse decoration during winter, as also in providing flowers for cutting. The principal thing in the management of bulbs for this purpose is to treat them so as to get plenty of active roots in the soil before putting them in heat to excite top growth. Without this there is little chance of success, on account of the deficiency of feeding fibres to support the advancing flowers and leaves. For this reason the bulbs should, before being put in heat, always be potted long enough to admit of the soil being well filled with roots. Hyacinths, which hold the first place amongst the bulbs used in this way, should be potted from the latter end of September to the end of November, according to when they are wanted in bloom. Large pots are unnecessary, a 5 or 6 inch pot is big enough for the largest bulb; often two or three are put in each one of that size, and the result is all that could be desired. Good loam, with a sixth of rotten dung and a good sprinkling of sand, will answer. Drain the pots, press the soil moderately firm, and put the bulbs with their tops just above the soil. As soon as they are potted plunge the pots in a bed of coal ashes, or cocoa-nut fibre, and cover them over to the extent of three or four inches. There let them remain until the soil is full of roots. When Hyacinths are to be grown in water, fill the glasses so that the base of the bulbs will not quite touch the water, and stand in a dark place until a good quantity of roots are made. The water should be changed before it gets at all foul during the growth of the flowers. Roman Hyacinths are often flowered in shallow pans that hold ten or twelve together, or, if preferred, four or six may be put in 6 or 7 inch pots. These little Hyacinths bear forcing well, and come into bloom long before the larger kinds can be had. To flower in the middle of November the bulbs should be potted as soon as they are imported. Other kinds of bulbs intended for forcing, such as Scillas, Tulips, Narcissus, Crocuses, Snowdrops, &c., require to be placed deeper in the pots, so that the bulbs may be entirely covered with soil. Put from one to half a dozen together in pots according to the size of the respective bulbs and of the pots used. In all cases see that the potting is carried out early enough, so that they may be well rooted before they are put in heat. Before the latter is done see that the top-growth, which will have made some progress, is gradually inured to the light, otherwise it will be injured. As soon as this hardening process is effected the bulbs must be stood where they will get plenty of light, or the leaves and flower-stems will be drawn up weak, and their appearance spoilt. A night temperature of from 50° to 60° is enough for the bulbs above-named, with a little more in the day; if kept too hot they will be injured. In all cases give some air in the daytime when the weather is favourable, and see that they are well supplied with water, especially when small pots such as advised are used.

CROCUSES.

Bride of Abydos. White.
Cloth of Silver. White, striped lilac.
David Rizzio. Purple.
Golden Yellow. Yellow.
Mont Blanc. White.
Purpurea grandiflora. Deep purple.
Queen Victoria. White.
Sir Walter Scott. White, striped lilac.

FREESIAS.

Leichtlinii. Yellow, lower petal orange blotched.

refracta alba. White.

HYACINTHS.

SINGLE WHITE.

Alba maxima.
Baroness Van Tuyll.
Grand Vainqueur.
Grand Védette.
Grandeur à Merveille.
Lady Derby.
L'Innocence.
Madame Van der Hoop.
Mont Blanc.
Princess of Wales.
Queen of the Netherlands.
Queen Victoria.

SINGLE BLUE.

Baron Van Tuyll
Charles Dickens.
De Candolle.
General Havelock.
Grand Lilas.
Grande Védette.
King of the Blues.
Leonidas.
Lord Palmerston.
Orondates.
Princess Mary of Cambridge.
Sir John Laurence.

SINGLE RED.

Amy.
Charles Dickens.
Dr. Livingstone.
Fabiola.
Garibaldi.
Grand Duchess.
L'Ami du Cœur.
Lord Wellington.
Macaulay.
Mrs. Beecher Stowe.
Robert Steiger.
Von Schiller.

SINGLE YELLOW.

Bird of Paradise.
Duc de Malakoff.
Ida.
Obelisk.

SINGLE LILAC AND MAUVE.

Charles Dickens.
Haydn.
L'Unique.
President Lincoln.
Sir Henry Havelock.
The Shah.

DOUBLE WHITE.

Florence Nightingale.
La Tour d'Auvergne.
Prince of Waterloo.

DOUBLE BLUE.

Blocksberg.
Charles Dickens.
Garrick.
Laurens Koster.
Louis Phillipe.
Van Speyk.

DOUBLE RED.

Grootvorst.
Koh-i-noor.
Lord Wellington.

DOUBLE YELLOW.

Crœsus.
Herione.
La Grandeur.

ROMAN HYACINTHS.

Early White.
Early Blue.

POLYANTHUS NARCISSUS.

Bazelman major. White, yellow cup.
Early double Roman. White and orange.
Early single Roman. White, orange cup.
Early Paper White. White.
Grand Monarque. Pure white and citron.
Grootvorst. White and citron.
Louis le Grand. White and sulphur.
Queen of the Netherlands. White and yellow.
Soleil d'Or. Yellow and orange.
Staten General. Cream and yellow.

Scilla sibirica.

SNOWDROPS.

Double.
Single.

TULIPS.

SINGLE.

Arms of Leyden. White, rose tinted.
Bride of Haarlem. White and crimson.
Cottage Maid. Rose pink, shaded white.
Duc Van Thol. Common, red and yellow.
Duc Van Thol. Crimson.
Duc Van Thol. Scarlet.
Duc Van Thol. White.
Keizer Kroon. Scarlet-crimson and yellow.
Pottebakker. Scarlet.
Pottebakker. White.
Proserpine. Deep rose.
Rose Grisdelin. Rose and white.
Rouge Luisante. Rose.
Vermilion Brilliant. Vermilion.

DOUBLE.

Duc Van Thol. Red and yellow.
Gloria Solis. Brownish-yellow, yellow edge.
La Candeur. Pure white.
Marriage de ma Fille. Cerise-red and white.
Overwinnaar. White, striped with bluish-purple.
Rex Rubrorum. Red.
Tournesol. Red and yellow.
Tournesol. Yellow.

The following bulbs can be grown in pots, similarly to the kinds already named, but do best when allowed to come on in a greenhouse temperature, or, in the case of those that flower in the late summer and autumn, stood out in the open air until the time of blooming:—

BABIANAS.

Atrocyanea. Blue.
General Scott. Purple and white.
Rosea grandis. Purplish-rose.
Speciosa. Blue.

Chionodoxa Luciliæ. Blue and white.

Gladiolus Colvillei, the Bride. White.

Hyacinthus candicans. White.

IXIAS.

Brutus. Yellow, crimson eye.
Glory. Brownish red, eye dark.
Golden drop. Golden yellow, dark eye.
Hypatia. Pure white, shaded lilac.
Lady Slade. Pink.
Lavinia. White, crimson eye.
Magnifica. Golden yellow, crimson eye.
Prestios. White, eye red.
Titus. Yellow, centre black.
Vulcan. Deep crimson, orange shaded.

JONQUILS.

Double. Yellow.
Queen Ann's double. Yellow.
Single Campernelle. Yellow.
Single sweet-scented. Yellow.
The Silver Jonquil. Silvery white.

Ornithogalum aureum. Yellow, purple centre.

SPARAXIS.

Angelique. White, yellow eye.
Grandiflora. Crimson, centre yellow.
Leopard. Yellow.
Maculata. White, with purple spots.
Tricolor. Red, white, and yellow.
Victor Emmanuel. Red and yellow.

TRITONIAS.

Crocata. Orange.
Fulgens. Orange-scarlet.
Incomparable. Very bright.
Prince Alfred. Rosy white, pink eye.

BURBIDGEA NITIDA.

This is the only species yet in cultivation of the newly-formed genus Burbidgea. It is a stove plant with thick fleshy roots and erect stems, like most of the order Zinziberaceæ, to which it belongs. The flowers are orange-scarlet in colour, produced in loose, erect heads, that at a distance might be mistaken for those of a Hedychium. The plant is said to flower several times in the year.

Its cultural requirements are similar to those of Hedychiums, which see. It comes from Borneo.

BURCHELLIA CAPENSIS.

A pretty evergreen stove shrub that bears handsome flowers, which when the plant is well managed are produced freely. The flowers are reddish-scarlet in colour, and appear early in spring.

It can be propagated and grown on like Rondeletias, which see.

There is another kind, B. bubalina, synonymous with B. parviflora, but it is inferior to B. capensis. Both are natives of the Cape of Good Hope.

CALADIUM.

These handsome stove fine-foliaged plants are so well known as to require little description; they are greatly alike in the formation of their leaves, which are arrow-shaped, and differ much in size and colour. The best way to increase them is from the sucker-like shoots which spring up from the crowns of the fleshy tubers. These can always be had in the spring from plants started a month or two previous. The roots should be potted and started in a heat of 65°. When the shoots are 5 inches or 6 inches long, they should be cut off with some of the fibrous roots which they will have formed above the tubers. Put them singly in 3-inch or 4-inch pots ; they will grow in either peat or loam to which has been added a moderate quantity of sand, with some rotten manure when the plants get larger. Keep the newly taken off shoots warm and close until they have begun to grow, after which remove the propagating glasses, and when they have filled the pots with roots move them into others considerably larger ; the stronger growing kinds, such as C. bicolor, need much more root-room than small growers like C. argyrites, nice plants of which can be grown in 6-inch or 7-inch pots. Through the latter part of spring and during the summer they will bear as much heat as most occupants of the stove, say 70° by night and 80° or 85° in the day. They should be placed where they will get full light, with a moderate amount of air in the daytime, and a thin shade when the sun is powerful. All required further is to give pot-room as needed. If large specimens of the large kinds are wanted, the tubers in the course of two or three years will require 15 or 16 inch pots. In the autumn, when the plants have ceased to make young leaves and show signs of going to rest, gradually withhold water, and when the foliage has died off keep the soil in the pots quite dry in a temperature of about 60° ; in this state they should remain until they are to be started, which it is well to do at two or three different times from January to March. By this means a succession of plants with healthy leaves will be secured.

There is now in cultivation a very large number of Caladiums, many of which do not differ enough from each other to make them worth growing. The following are amongst the best and most distinct :—

C. Adolphe Adams. Leaves pale green, mottled with white ; centre nerve red.

C. Alfred Bleu. Pale green, spotted with white, pale pink centre.

C. argyrites. A very small kind, suitable for growing in little pots ; its leaves look well mixed with cut flowers ; they are light green, blotched and freckled with white.

C. Auguste Lemonier. Shaded green, midrib and nerves crimson.

C. Baraquinianum. Dark green, with broad crimson centre.

C. Belleymei. Large leaves, beautifully variegated.

C. bicolor splendens. A very strong grower, lovely green ground colour, with deep crimson blotches.

C. Dr. Boisduval. Centre of leaves crimson, pure white spots.

C. Calypso. Large foliage, red in centre, outer margin mottled with red.

C. Chantini fulgens. Green ground, crimson centre, outer part of leaf-blade spotted white.

C. Chelsoni. Deep green, blotched with crimson and bright red.

C. Emilie Verdier. Leaves pale pink, freckled with red ; a distinct and handsome kind.

C. Herold. Light green centre with red veins, white speckled, outer margin of leaf a deeper shade of green.

C. La Perle du Bresil. Large leaves, with white ground colour, spotted with rose ; nerves and midrib green.

C. Madame Alfred Bleu. Even blotches of clear white on a dark green ground, nerves very bright red.

C. Minerve. Middle of leaves white, outer part green, dotted with white.

C. Napoleon III. Bright red centre, outer portion of leaf green, spotted with crimson.

C Prince Albert Edward. Bright green, profusely spotted with white, crimson midrib and veins.

C. Rameau. Middle of leaves red, shading to green towards the margin, which is spotted white and pink.

C. Reine Victoria. Nerves and margins of leaves green, spotted with white and crimson.

Insects do not trouble Caladiums much, their smooth leaves and acrid juices not offering either shelter or food for them ; aphides and red spider, however, will sometimes make their appearance, and these can be destroyed by syringing and fumigation.

CALAMPELIS SCABRA.

An evergreen greenhouse climber of free habit, suitable for covering a considerable space.

It can be increased by seeds or cuttings struck and grown on like the Tacsonias, which see.

The flowers are orange-coloured, and are produced in summer. From Chili.

CALAMUS.

A genus of stove Palms of moderate growth.

Caladium Max Kolb.

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Propagation and cultivation given under Palms, general details of culture.

C. adspersus. A very thin-stemmed kind, with small pinnate leaves. It is well adapted for use where larger sorts would not be admissible. It comes from Java.

C. ciliaris. A thin-stemmed species, with a distinct habit of growth; remarkably pretty whilst in a young state. From India.

C. fissus. This is particularly handsome while in a small state; the pinnate leaves are very distinct in appearance. It comes from India.

C. Verschaffeltii. A handsome and distinct-looking species that attains a medium size. From Madagascar.

CALCEOLARIA.

There are two sections of these pretty, free-flowering greenhouse plants, represented by the herbaceous and the shrubby kinds: the former bear much the most showy flowers, the latter give a longer succession of bloom. The original species from which both have been raised came from Chili and Peru. Both can be obtained from either seeds or cuttings; the herbaceous kinds have been so much improved in recent years that a good strain of seed may be relied on, to afford flowers sufficiently attractive in form and colour. The seeds should be sown about the end of July in shallow pans, drained and filled with finely-sifted loam, to which one-fifth of leaf mould and a little sand has been added. Press the surface smooth and water to fill up the interstices, otherwise the seed, being very small, will be liable to get too deep. Allow a day for the soil to dry a little, and then sow the seed, but not too thickly. Cover the seed very slightly, stand in a frame or greenhouse, and shade the surface of the pans from the sun so as to avoid the necessity of giving much more water until the seedlings are up. Immediately they appear keep close to the glass, shading when the sun comes on them, and giving sufficient water to keep the soil fairly moist. Give some air in the day-time and keep the atmosphere moderately moist. When they are large enough prick them off two inches apart in pans, or boxes, in soil like that in which the seed was sown, and treat as before, with the exception that the sun's waning influence will make further shading unnecessary. When the leaves are about an inch long, move singly into 3 or 4 inch pots; keep them growing through the winter, and for this purpose a night temperature of about 45° will be sufficient. Give air daily in mild weather, and stand the pots on a moist bottom, as the plants do not like an over-dry atmosphere. Never allow the soil to get dry. About the end of February or the beginning of March move them into 8-inch pots, using the soil a little more lumpy and with one-sixth of rotten manure in addition to the leaf mould and sand as before. With the increase of warmth on sunny days give a little more air, but draughts must be avoided, or the leaves will be injured. Keep the night temperature about the same as hitherto. They will now move fast, and if it is thought desirable to grow some of the stock large, in six weeks move the strongest into 12 or 13 inch pots; but for ordinary decorative use the 8-inch pots will be big enough. A thin shade should now be used in the day in bright weather, and the plants dewed overhead with the syringe each afternoon at closing time. As the roots get well hold of the soil give manure-water once or twice a week. Calceolarias are gross feeders and like liquid stimulants. Continue to treat in this way, and put a thin stick to each flower-spike as it gets long enough to require support; keep on shading when the bloom is open, during which time give more air. When the flowering is over such of the best varieties as are considered worth saving seed from must be well attended to until it is ripe, when they may be discarded, and a fresh lot raised from seed.

Where the shrubby kinds are raised from seed the treatment should be similar to that which has been described for the herbaceous varieties, except that, being less vigorous growers, they do not need so much root-room the first year as advised for the largest of the herbaceous sorts. Cuttings may be put in at any time during the spring or autumn—about March will usually be the best. Take the young side shoots whilst the wood is soft and they consist of about three joints; remove the lowest pair of leaves, and put four or five together in 6-inch pots filled with sand. Keep quite moist, moderately close, and shaded in a temperature of about 50°. They will root in two or three weeks, when give more air, and move singly into 4-inch pots drained and filled with soil similar to that advised for the herbaceous kinds. The after treatment will also be similar except that when the plants begin to move freely the leading shoots should be stopped to cause them to grow bushy; when the shoots thus induced to break are large enough, each should be tied out to a small stick. As soon as the soil is moderately filled with roots, move the plants into

7 or 8 inch pots, now giving plenty of air. They will flower nicely through the latter part of summer, and to help them give manure-water once or twice a week. After blooming the shoots should be well shortened back, and the plants given ordinary greenhouse treatment through the autumn and winter. Early in spring give pots 2 or 3 inches larger; remove a portion of the old soil and replace it with new of a good rich description such as hitherto advised. Tie the shoots well out as they advance, and treat in other respects as in the previous spring. This season they will make good blooming specimens, and will be very useful for conservatory decoration. To assist the natural disposition to keep on flowering give manure-water regularly When the autumn comes round they may either be discarded to make way for younger stock, or again cut back and managed through the winter and following spring as before; if required they will last by this kind of treatment for several years.

INSECTS.—Calceolarias are not much affected with any insects except aphides, which are very partial to them. The shoots should be looked over every ten days or fortnight, and immediately any of the insects are discovered fumigate slightly, repeating the application until the aphides are killed. These plants do not like severe smoking.

CALLICARPA PURPUREA.

The different species of the genus Callicarpa are most remarkable for the pretty appearance of their fruit. C. purpurea, an evergreen stove shrub, is the most desirable kind; it is easily managed and is very effective when its numerous berries have attained their bright colour. It strikes readily from shoot cuttings put in in spring in sand, kept moist, close, and shaded in a temperature of 70°. When well rooted they should be moved singly into 3-inch pots and kept in the same temperature until the young plants get established; afterwards 5° less will be enough in the night, and it should be allowed to rise by day in proportion to the state of the weather. Pinch out the points of the shoots, and keep the plants near the glass; give air in the day, with a little shade when necessary. As soon as the soil is full of roots give 8 or 9 inch pots, and again stop the points, putting a stick to support the leader. Through the summer treat as required by the ordinary winter decorative plants that want to be kept closer, and in an atmosphere somewhat more moist than that of a greenhouse, with a little shade in bright weather. When the pots have got well filled with roots, manure-water will be beneficial. In the winter place the plants where they can be kept in the night at a heat of about 55°. When the berries get fully coloured the plants are very effective, and remain so for a lengthened period. It is a native of India.

INSECTS.—Aphides sometimes attack this Callicarpa; the remedy is fumigation with tobacco.

CAMELLIA.

Among the immense number of greenhouse flowering plants that have been introduced into this country, it would be difficult to point to any that surpass the Camellia either in the general estimation in which it is held, or in its adaptation to the various purposes for which flowers are required. True, neither the plant, taken as a whole, nor its individual flowers, can lay claim to the graceful elegance possessed by many things in cultivation; yet, in a well-grown example of Camellia, especially of a white variety, clothed with its chaste flowers, backed by ample, glossy, deep-green foliage, there is a massive grandeur equalled by few plants. Nor do the flowers individually, when fully blown, and grouped with the choicest productions of the stove or Orchid-house in a vase or epergne, or the half-opened buds that grace a bridal bouquet, lose by comparison with the fairest of flowers grown. When we add that, if desirable, the flowers may be had nearly the year round, that the plant is easily grown, and that with fair treatment it will last individually half a century, we have an assemblage of properties that place it in the front rank of flowering subjects.

The first of the species that found its way to this country came before the middle of the last century; but it was about 1824, when the double white (alba plena) and the red semi-double reticulata made their appearance, that their value was fairly understood. These were followed by numerous others, of more or less merit, and from these have sprung the numbers of grand varieties that we now possess, and which have so well rewarded the care and patience of the seedling-raiser. Some of the semi-double varieties seed tolerably freely, and the seeds can be induced to vegetate without difficulty; but the raising of new varieties may be safely left in the hands of those who interest themselves in this kind of work, and it will be better to confine these remarks to the general details of cultivation.

Though Camellias strike readily from cuttings made of the half-ripened shoots, the more usual and also more satisfactory method of increase is by grafting in some of the ordinary ways on the free-growing single kinds; but this work, also, will be generally better left to those who make the propagation of this and kindred subjects their business. In the selection of young stock to grow on, there are two things to be kept in view—first that the plants should be in a free vigorous state, not pot-bound, and that they should be of the right shape. Quantities of the young plants sold are wanting in the latter requirement. They usually consist of a single shoot, inserted in the stock some 6 inches above the collar, and allowed to grow on with a leading stem; from this, at 10 or 12 inches above the pot, proceed several weaker shoots, which seldom get a chance of attaining their wonted strength through the leading shoot being allowed to run away with more than its share of sap; and the result is that in after years these side branches die off, and leave the plants naked and bare at the bottom. If the leader had been stopped at the proper time so as to induce the production of three or four shoots of equal strength, and these in their turn had been again timely shortened to cause them to break back, the foundation for a well-shaped specimen in the future would have been laid. Half the Camellias we meet with are spoilt in the early stages of their existence for want of sufficient use of the knife. Camellias are naturally of a bushy habit, and for general purposes are much best grown in bush form.

Young plants procured early in the spring, just before they begin to grow, may at once be placed in a night temperature of 55°, and the heat may be allowed to rise 10° or 15° in the day-time. Keep the soil well moistened, and syringe overhead once or twice a-day, as Camellias require to be kept, especially during the growing season, moist at the roots and in a humid atmosphere. Previous to the commencement of growth the branches should be tied out, so as to admit light to the centre of the plants, and to give them the required shape; but in this training the shoots must not be bent down to a horizontal position as advised with most hard-wooded subjects. If this is done the effect will be to stop the points of the branches from extending further, and to cause them to break back in a way neither requisite nor desirable. Any branch that is stronger than the others, it will be well to tie down a little lower; thus the others will be strengthened, and when growth has fairly commenced any shoots that show a disposition to take an undue lead should be pinched out. This is much better than letting them grow on to the end of the season. and afterwards cutting them back, as the latter plan causes a waste of strength, as well as a sacrifice of time in getting the plants up to a useful size.

During the growing season they will need a thin shade to protect them from the direct influence of the sun; but nevertheless they must have plenty of light, and not be stood too close together. To overshading and overcrowding through the growing season may be attributed the unsatisfactory condition in which these plants are often found. Give a moderate amount of air in the early part of the day, and shut up soon enough to secure, by the help of the sun, a warm, close atmosphere in the evening. When the shoots have ceased to extend further, the flower-buds will form in the points. As soon as these are fairly distinguishable pot such as require it; for although Camellias are plants that do not need or will not bear so much root-room as many things, they must not be allowed to get pot-bound. If the plants are in 6 or 8 inch pots, a 2-inch shift will be enough. They will thrive in either loam or peat; the latter induces more luxuriant foliage, with a greater disposition to growth, but good turfy loam is preferable, as it does not so soon get exhausted, and the plants usually flower freer in it. The turf, cut about 2½ inches thick, should be stacked sufficiently long before use, but not longer than necessary to allow of the roots of the grass dying, for if these are further decomposed the plants do not grow so freely in it, and the soil is more liable to get into an adhesive state before it is fully occupied by the roots. The turf should be broken by hand, into pieces about the size of small walnuts for young stock, and larger for such as are older; add sand in proportion to the more or less sandy nature of the loam, bearing in mind that they should never need shaking out, or the removal of any considerable portion of the soil; therefore enough sand should be mixed with it to ensure continued porosity.

Before moving the plants from the pots they occupy, see that the balls are quite moist. If in good condition the roots will be closely interlaced round the ball, often enveloping the drainage material, which should be removed completely; disentangle a portion of the outside roots, so far as can be done without much breakage—they are very brittle; drain well with clean crocks, covered with some of the turfy matter selected from the soil, so as to effectually prevent the finer portion from getting down among them. In potting, ram the new soil to make it quite close and as solid as the ball. If this is not done, when water is given it will pass off through the new material, leaving the old quite dry, in which case a sickly condition of the plants will follow. After potting, replace them in the house or pit they have previously occupied, keep them a little close, shade as heretofore, and syringe in the afternoons. They will not need water at the root for some days, during which time any roots that have been broken will have time to heal. The reason for potting Camellias when their growth is approaching completion, and at a time different from that found the best for most plants, is that early in the season, for some time previous to any development of top growth, their roots are actually at work, and from their exceptionally brittle nature, especially whilst young, they cannot be disturbed without injury to an extent that generally seriously interferes with the top growth for the season. The evil consequences of this are avoided by moving them at the time here advised; but the potting, particularly with plants that have acquired considerable size, and whose flowering is of much consequence, must not be deferred too long—that is until the flower-buds have grown to any considerable size, or the inevitable result will be that they will fall off. The roots will soon enter the new soil, as, when the plants are in good health, they keep on growing after the wood-growth is completed. They will now require no warmth but simply ordinary greenhouse protection, with plenty of air; they should be slightly shaded during the middle of the day, when the weather is bright, so long as the sun is powerful. The soil even during the autumn and winter must never be allowed to get dry. As to temperature, they will need nothing more than sufficient to keep out frost.

Having a natural free disposition to flower, even in a very small state, they will bloom the ensuing spring, but if their flowers are needed for cutting, they should not have much or any of the wood removed with them while so young, or it will interfere with their growth; for most purposes in which Camellia flowers are now used, they are cut or twisted off without any wood attached, and afterwards mounted on wires. This is a great gain to the plants, even when large and strong, as it enables them to produce a full crop of flowers every year, which was not the case when many of the shoots were cut with the flowers—a practice frequently carried so far as to bring about a stunted, unhealthy condition. Each subsequent year's treatment will be similar to that advised for the first, so far as warmth, shade, and moisture during the season they are making their growth are concerned. They should be potted at such intervals as they require it, but this will not be necessary every year, even in their younger stages, and as they get large they will frequently go on for years without additional room. At the same time, they must not be too much confined at the root, and whenever they evince signs of weakness by making less growth they should be moved to larger pots or tubs. As they get big enough for the latter, any branches that show a disposition to outgrow and impoverish the weaker ones should be shortened back and bent down; but with sufficient room and fair treatment when the training has been properly attended to in the early stages of their existence, the natural habit of most varieties is such as to entail little difficulty on this head.

Some growers fully expose their plants out in the open air during the summer after the flowers are set; but this is a bad practice, as if stood where the foliage is sufficiently shaded by trees or walls to prevent its getting discoloured by the sun, they are exposed to heavy rains, whereby the soil gets saturated to an extent that causes it to become sour. This often induces a diseased condition of the roots, or, if less serious in its consequences, causes the buds to fall off later when they should be near approaching expansion. The buds will drop too if the plants ever get too dry at the roots after the buds have attained any considerable size, or if they are kept in too high a temperature with insufficient moisture in the atmosphere; in fact, Camellias will not bear any attempt at forcing. Some kinds however open their flowers much more freely in a temperature a little above that of an ordinary greenhouse, but where there is a disposition to accelerate their flowering, 45° to 48° in the night, with 6° or 8° more in the day, is hot enough.

If Camellias are required to bloom earlier than they have done the preceding year, they should, after the flowers are set, be kept in heat until the buds are grown to a size that will enable them to expand without the application of anything much above a greenhouse temperature, after they have once been removed from the warmth to which they have been subjected whilst making growth and setting their buds.

Though they may be kept in a temperature such as existed whilst the growth was being made, even until the flowers expand if such be desirable, their removal from the influence of such heat appears to induce a slower condition of flower development that will bear little attempt at acceleration. Camellias look well trained over a back wall in a greenhouse or cool conservatory, either grown in pots, tubs, or planted out. In the last way they increase in size more rapidly, as they do, also, when planted out in a well-prepared bed in the body of the house. So treated, they thrive in a way that cannot be equalled by pot or tub culture, but when they are to be grown in this manner they should not be planted out in a very small state, as the limited quantity of roots they possess are not able to take hold of the large body of soil before it gets into a sodden state. The principal objection to planting a collection of Camellias out is, that the system does not admit of a portion of the stock being removed to cooler quarters after the buds are set, so as to retard their flowering and thus afford a longer succession, or of starting some later with the same object; neither can the plants be so readily washed with any insecticide for the destruction of insects.

When Camellias that have attained a moderate or considerable size happen to get into a stunted condition, with an insufficiency of branches and foliage, there is no method equal to planting out for restoring them to health. Where this has to be done, a bed of good turfy loam or peat, if the plants are much enfeebled, should be prepared, with enough sand added to ensure porosity. It should be made at least 6 inches deeper than the depth of the balls of the plants, and the bottom well and carefully drained, into this they should be turned out, either in spring before growth commences, or, better, after the growth is fully completed, but in the case of plants in the state under consideration the later time of moving is not of so much importance. To prevent any possibility of the balls getting dry it will be well to puncture them freely from the surface to the bottom with a stout iron wire in the form of a skewer. With the same view also the soil surrounding the ball must be well-rammed, and made an inch or so higher than the surface of the ball, so as to force the water given through it. After the first season, when the roots have extended, the soil thus raised may be levelled down. Camellias so treated generally break out quantities of young shoots from the old wood, and in a few years get dense and full of growth, when, if desired, they may be taken up and replaced in pots or boxes. This should be done as soon as the buds are set, keeping the plants close for some weeks. If the operation is carefully carried out, and they are afterwards fairly treated, they will generally flower freely the ensuing winter and spring.

When Camellias get into a straggling, naked condition it is frequently desirable to cut them right back to the strong branches, or to head down so far, removing the top altogether to within 8 or 9 inches above where grafted. The union with the stock is usually easily to be seen, and, although no eyes on the stem are perceptible, it will break into growth at every place where there was a leaf during the earliest existence of the scion; but heading down, or even cutting back to any extent, should never be attempted unless the plants are fairly stocked with healthy roots, as death will most likely be the result. The operation ought to be carried out in the spring, a month or so before the wood-buds have begun to swell; if deferred later, the stools generally bleed to an injurious extent. When headed down they should be placed in a gentle heat and the soil kept slightly moist, but not wet. A little more water may be given when broken fairly. Keep during the summer in a growing temperature, with a moderately humid atmosphere. They usually make long, vigorous growth, which will need stopping and slightly tying out so as to make them shapely.

The after treatment required will be of a similar nature to the ordinary stock. There is some difference of opinion amongst growers of Camellias as to the use of manure-water. We have tried liquid stimulants of different kinds, and have found them decidedly beneficial (especially to plants that are rather deficient in pot-room), when given just before and during the season of their making growth, but at no other time. Liquid from stable manure with a little soot added will well answer the purpose.

The following is a list of the best kinds, old and new:—

C. alba plena (double white). Still unsurpassed for all properties.

C. Archduchesse Marie. Red, banded with white, imbricated; flowers very double.

C. Bealii. Very deep crimson. One of the best; flowers late in spring.

C. Bonomiana. White, banded with deep red.

C. candidissima. Medium-sized flower

of the purest white; blooms late in spring. Should have a place in the most select collection.

C. Chandlerii. A strong-growing crimson kind, very showy.

C. M. Hovey. Deep velvety crimson, with dark shading; very distinct.

C. Contessa Lavinia Maggi. White, striped with carmine; flowers very large. Unsurpassed amongst the striped varieties.

C. Cup of Beauty. White, striped with rose; good form, and beautifully imbricated.

C. Donckelaari. Semi-double, rich crimson, beautifully marbled with white.

C. Duchesse de Berri. Pure white, cupped, and beautifully imbricated.

C. fimbriata. Pure white, very double, splendidly imbricated, fringed petals; a superb variety.

C. Henri Favre. Flowers beautifully imbricated; colour pinkish rose. A splendid variety.

C. imbricata. The finest of all the double reds; flowers sometimes marbled with white.

C. imbricata alba. White, sometimes striped with carmine; a fine variety.

C. Jenny Lind. White, striped and spotted with rose.

C. Jubilee. A pinkish white, specked and splashed with rose.

C. Lady Hume's Blush. Carmine, with a white tint—a beautiful kind, the plant somewhat straggling in growth.

C. Mathotiana. Large, rich crimson; imbricated. A magnificent kind.

C. Mathotiana alba. Pure white, similar in every respect to the preceding, except colour. Very fine.

C. Monarch. Rich scarlet veined with crimson, irregular centre; a large fine flower.

C. Mrs. Abbey Wilder. Ivory white, striped with rose, well imbricated.

C. Mrs. Hovey. Light pink; of medium size.

C. Napoleon III. Rosy-crimson, edged with white.

C. Princess Bacciochi. Deep glossy carmine, regularly imbricated; a beautiful kind.

C. Princess Frederick William. White, tipped with carmine.

C. reticulata. A semi-double kind, with very large bright rose flowers.

C. Storyi. Outer petals bright rose, with a whitish centre.

C. Targioni. White, striped with cerise; a beautiful imbricated flower.

C. Teutonia. Pale rose, striped with white.

C. Thomas Moore. Bright carmine, shaded with crimson; flowers large and well imbricated.

C. tricolor imbricata plena. Blush white, flaked with rose and carmine.

C. Valtevaredo. Bright rose, sometimes spotted with white; imbricated. A large and magnificent flower.

C. Vicomte de Nieuport. Beautiful rose, large, and finely imbricated.

INSECTS.—Camellias suffer from most insects that infest pot-plants, although it is only in extreme cases of neglect that thrips or red spider do them harm. Mealy bug will live and thrive upon them, but from the nature of both wood and leaves is easily removed; brown scale is also sometimes troublesome, increasing fast during the growing season, but as it confines itself principally to the leaves, it is easily removed by sponging. White scale is their greatest enemy, and is difficult to eradicate if once it gets to a head, getting into every crevice in the bark, on the shoots, the leaves, and on the buds. Careful and thorough brushing, with the use of a small-pointed stick of soft deal to get into the crevices, where the insect takes up its quarters, and sponging the plants afterwards, constitute the best method of keeping down the pest.

CAMPYLOBOTRYS.

Interesting stove plants of shrubby habit, grown principally for their foliage, which is pretty when they are kept clear from insects, but if these are let to get ahead they injure the leaves. They are easily propagated from shoot cuttings in spring; several should be put together in moderate-sized pots filled with sand, kept moist, close and shaded, in a temperature of 70°. When rooted pot singly; peat with some sand and a little leaf-mould suits them best. As soon as they begin to move freely stop the points of the shoots to induce bushy growth: stand in a light position, and give a little shade in bright weather, with a moderate amount of air in the day, during which they will bear a temperature of 85° through the summer. Towards the end of June give pots two sizes larger, and continue to treat as hitherto. Syringe them freely overhead at closing time, until the end of August, when discontinue it as well as the shading. Winter in a night temperature of 56° or 58° and stand as near the roof as convenient, give larger pots in spring, and treat subsequently as in the previous summer; they will make nice specimens in one season.

The following are desirable kinds:—

C. Ghiesbreghtii variegata.

C. pyrophylla.
C. refulgens.
C. regalis.

All the above have variegated leaves.

INSECTS.—Mealy bugs and thrips are often troublesome on these plants. Syringing in summer and sponging in winter are the best remedies for the former; for the latter fumigate.

CANNA.

Although mostly used for planting out-of-doors in summer Cannas are fine Conservatory plants when grown in pots, where their ample leaves and distinct flowers are very effective.

They are easily raised from seeds sown in heat in spring and grown under the usual conditions, but it is much better to depend on the best selected kinds, as seedlings do not come true to character. They are readily increased by division of the crowns, which should be separated and potted singly early in spring before they begin to grow. Keep them for a few weeks in an intermediate temperature until they get established, and some progress is made. All that is further required is to give larger pots as additional root-room becomes needful. Through the latter part of spring and during summer let them have plenty of light and air, with such shade as is found requisite to keep the leaves from injury. Syringe freely daily, and give abundance of water to the roots through the summer. When autumn comes and the plants get shabby, head them down and keep in the pots in a semi-dry state in a temperature of 45° to 50° during the winter.

The undermentioned are fine kinds, hybrids of C. indica:—

C. Annei rubra. Scarlet flowers.
C. Bihorelli splendens. Scarlet flowers.
C. Chatei discolor. Fine dark leaves.
C. compacta. Flowers yellow and red.
C. Daniel Hoibrenck. Yellow flowers.
C. discolor. Dark stems and leaf margins.
C. Ehemannii. Brilliant carmine.
C. erecta. Red flowers.
C. erecta foliis striatis. Variegated.
C. Gloire de Lyon. Orange flowers.
C. indica superba. Red flowers.
C. Majestueuse. Orange flowers.
C. Oriflamme. Flowers orange-salmon.
C. Prince Imperial. Crimson flowers.
C. Rendatleri. Orange flowers.
C. rubra superbissima. Orange-red flowers.
C. Van Houttei. Orange-red flowers.
C. Warscewiczii major. Scarlet flowers.

INSECTS.—Syringe freely to keep down red spider; if aphides are troublesome fumigate.

CANTUA BUXIFOLIA.

This is a Peruvian plant, with somewhat the appearance of Fuchsia corymbiflora in the way its flowers are produced, but it is not so strong a grower, and the leaves are very much smaller than those of the Fuchsia in question.

The plant has an erect habit of growth, and is more inclined to spire up than to form a dense bush. It is best suited for clothing the supporting pillars of a greenhouse or conservatory, for which purpose it has few equals; there its large drooping panicles of long, tube-shaped, crimson flowers are seen to the best advantage. Although seldom met with it deserves a place in every greenhouse. It succeeds with similar treatment to that advised for Fuchsias, which see. It flowers in spring, or early summer, according to the temperature kept up in the house it is grown in.

CARNATION.

(Perpetual Flowering.)

The Tree Carnations, so called from the tall straggling form that the old varieties formerly grown naturally had, have been superseded by a race of plants that possess a bushy habit of growth, with free and continuous disposition to flower, so that with a sufficient number of plants they may be had in bloom all the year round. Carnation flowers are justly held in high estimation for bouquets and other arrangements of a like nature. Perfume, enduring properties, and beautiful colours go to rank them amongst the most attractive of all flowers.

They can be raised in different ways—from seeds, cuttings, and layers. The seeds should be sown about the beginning of February in shallow pans or boxes, in sifted loam, with some leaf-mould and sand added. Just cover the seeds with soil; stand in a temperature of 55° or 60°, and they will soon vegetate. Then place near the glass and give air in the day so as to prevent the growth from being drawn; as soon as the young plants have got two or three leaves each put them singly into small pots, using soil similar to that in which the seeds were sown. The increase of sun-heat will now do away with the need of fire-heat, except when the nights are cold. When the roots have made some progress the plants should be moved to a cold frame, and aired freely so as to prepare them for planting out in the open ground towards the end of May. Choose an open place where the soil is of a good description, and dig in some rotten manure and leaf-mould. Put the plants a foot apart, with a little more room between the rows; pinch out the points, otherwise they will not be furnished with sufficient shoots, and give water in dry weather. In September lift them and put in 6 or 7 inch pots in good rich loam, to which add a little leaf-mould, rotten manure, and sand; water moderately, and stand in a light house or pit near the glass. The plants should now be furnished with from four to half-a-dozen shoots each; these will push up flower-stems through the autumn, and come into bloom sooner or later according to the warmth they are subjected to. When the flower-buds are prominent a temperature of 50° in the night will accelerate their opening; such as are required for later flowering must be kept cooler. After blooming the plants ought to be again turned out in May, or later in the case of those that have been kept back for late spring flowering. In all cases cut out the old bloom stems at the bottom as soon as the last flowers are over; if this is not well attended to with the young plants, as well as with the old and large, they get into a tall unsightly state, and are much less manageable.

When out in the open ground they must not want for water, or be allowed to suffer through the ravages of aphides. Again, in September take up and put them in pots 7 or 8 inches in diameter, and treat as in the preceding season. A portion of the plants this second season should not have their shoots stopped; these will come into bloom early in the autumn, and be succeeded by the remainder that have had their shoots pinched back about July.

Cuttings should be struck in autumn, several together in 5 or 6 inch pots filled with a mixture of sand and loam. Stand them on a slight hot-bed, and if kept shaded and moist they will soon root. Then they must gradually be subjected to more air and a lower temperature, after which, put singly in small pots, and keep them through the rest of the season in a frame or pit. Winter out of the reach of frost; stop the shoots, and turn them out in a bed in May, and treat subsequently as recommended for the plants raised from seed. Layering should be carried out in the summer, about the same time as in the case of the exhibition varieties of Carnation.

The following are all good kinds:—

C. Alegatiere. Red.

C. Andalusia. Primrose yellow.

C. Cassandra. Buff ground colour, edged with scarlet.

C. Fire-Fly. Scarlet.

C. Gloire de Nancy. Pure white.

C. La Belle. White.

C. L'Hermine. White.

C. Lucifer. Intense bright scarlet.

C. Mary Morris. Rose colour.

C. Miss Jolliffe. Pale pink.

C. Mont Blanc. Pure white.

C. Mrs. George Hawtrey. Yellow.

C. Mrs. Maclaren. Crimson bizarre.

C. Osman Pacha. Bright scarlet.

C. Reverse. Scarlet, at times striped.

C. Souvenir de la Malmaison. Blush white.

C. Souvenir de la Malmaison. Pink variety.

C. The Queen. Pure white.

C. Vestal. White.

C. Warrior. Deep scarlet.

INSECTS.—Aphides are often troublesome, but can be got rid of by fumigating with tobacco or dipping in tobacco-water. Mildew sometimes affects them, for this dust with flowers of sulphur.

CARYOTA.

A tall-growing genus of Stove Palms, indigenous to widely different parts of the world, being found in America, China, and India. For propagation and cultivation, see Palms, general details of culture.

C. urens (syn.: C. sobolifera). A stately tall-growing species, extremely useful in the country where it grows; it yields in quantity a saccharine juice, which is made into Palm wine, and also sugar. This Palm attains a large size before it begins to flower; afterwards the blooming process is continued until the plant dies, evidently from the exhaustion thus caused. It is indigenous to Ceylon, Malabar, Bengal, and other parts of India.

CASSIA CORYMBOSA.

This handsome bright yellow-flowered greenhouse plant is from Buenos Ayres. It belongs to a very numerous family indigenous to a wide extent of country, over both the eastern and western hemispheres, but few of them are of much account for cultivation in greenhouses. It is of comparatively easy growth and a very suitable subject for beginners in plant-growing to try their hands at, as it is not very impatient in respect to water. It is more deserving of cultivation on account of its colour, yellow not being common among plants adapted for pot-culture in houses where a night temperature of 40° or lower is kept up during the winter season. It has long been known in this country, having been introduced towards the close of the last century; and it is one among many of fine things that some years back were allowed to fall into comparative neglect. More recently the way in which it has been produced by some growers has shown what it is capable of when fairly treated, and it is now receiving the attention that its merits deserve. When thoroughly well managed it is effective as an exhibition specimen for late summer use, but from its continuous flowering disposition, rather than from an ability to produce an extraordinary quantity of bloom at one time, it is better adapted for greenhouse or conservatory decoration than for the exhibition stage. It is a free, comparatively strong-rooted plant, not particular as to soil, thriving in either peat or loam; but as most things of a similar character that will succeed in loam are more disposed to flower freely in it than in peat, it is better to grow it in loam, which should be of a good fibrous nature, containing naturally or mixed with it a sufficient quantity of sand to keep it in an open porous condition. This is more essential as the plant will, with ordinary care, last for a number of years, and moreover, it does not like that mutilation of its roots which is inseparable from shaking out.

Cuttings taken off with a heel about the beginning of March, will strike under the ordinary conditions of moderate heat and moisture, if kept close, with a little shade when the sun is bright. In six or eight weeks they should be well-rooted so as to bear moving into 3-inch pots. Keep them warm and a little close until the roots have begun to move freely, then stop the points and give more air, but still encourage growth by a genial temperature, and moisten them overhead at closing time in the afternoons. About the beginning of July move them into pots 2 inches larger, and continue to encourage growth until the end of August, when admit more air, and give greenhouse treatment through the winter. In March move into pots a couple of inches larger. Use a fair amount of drainage, break the soil up by hand into pieces about the size of walnuts, and be careful that it contains no worms. It is necessary to be more mindful in this matter with loam than it is with peat, as the latter is not so subject to worms. A little well-decomposed manure may be used, but not more than one-sixth, or the soil will be made too light, in which case it shrinks into little room as the manure becomes further decomposed; pot firmly, pinch out the points of the shoots, and at once train them out in a horizontal position, bringing them down as nearly as possible on a level with the rims of the pots.

If the plants can be placed in a light house, where a night temperature of 45°, or a little higher, is kept up, they will progress all the quicker. If there happens to be at hand a pit where the above conditions as to temperature exist, with plenty of light, it will answer for them in every way; but although this Cassia will make much greater progress with a little extra warmth, it is by no means advisable to subject it to hot treatment, which has the effect of producing weak, elongated growth. After a few weeks the plants will get established, and should have plenty of air, but do not place them in the way of a direct draught. As the days get longer, with more solar heat, syringe them overhead in the afternoons, and close the house while the sun is upon the glass; by midsummer, if all has gone well, they will have made 6 inches of growth, and should again have their points pinched out. It is necessary to persevere with stopping while the plant is young so as to correct its natural tendency to straggling growth, otherwise the base will not be sufficiently furnished. Directly they have again broken into growth give them another shift; 2 inches additional will be enough, as, although a strong-rooting subject, it does not make a profusion of roots. Use similar soil to that recommended for the first potting, and continue to treat as hitherto; give more air in August and September, and leave it on at night as well as day to ripen the growth. In September cease syringing overhead to stop growth.

As autumn advances, go over the plants and put them into shape: they do not require many sticks, but use sufficient to keep them in proper form. Through the winter let them be in a light situation, and in a temperature of about 40° during the night, with considerably less water at the roots. Again in March give them another 2-inch shift, and once more pinch out the points of the shoots as heretofore, keeping them a little close after potting. As growth increases train the branches out, and keep them well down; this will cause the plants as they get strong to break back in the old wood near the centre. Treat through the spring as in the preceding season. By the end of June the young shoots will have made considerable progress, but must not be stopped this summer, otherwise the flowers, which are produced in succession as the growth advances, will be sacrificed. The plants will now be very useful for decoration of the conservatory, to which structure they may be removed; there they will keep on blooming until the autumn is advanced, when they should be transferred to their winter quarters, in a similar temperature to that in which they were kept the preceding season. As the previous season's shoots will have attained a good length through being allowed to grow without stopping, they should in the spring, a little before growth commences, be cut back to within 6 inches of the point to which they were last spring stopped. If not well shortened in this way the plants will get an untidy, straggling appearance, as the leaves are not long retained on the old wood. When they have fairly broken into growth give them pots 2 inches larger, and treat as previously advised through the summer and succeeding winter; in the spring again shorten back the shoots, but unless very large specimens are wanted it will not be necessary to repot them—the requisite assistance can be given by the use of manure-water once a week. By stimulants of this kind the plants may be kept in good healthy flowering condition another summer, after which it will be needful either to give larger pots or to remove several inches of the surface and replace it with new soil containing one-fifth part of rotten manure. This is one of the comparatively few hard-wooded greenhouse plants that will bear this replacement of the surface soil without danger of injury to the roots or collar.

This Cassia is equally well adapted for covering a back wall in a greenhouse or conservatory, or for clothing a pillar; in the former case it should be planted out in a well-prepared border of good sandy loam, with drainage enough to ensure a ready exit for the large quantities of water a plant with such an amount of leaf-surface will require. Small plants, previous to turning out, should be grown for a season, as advised for pot specimens, so as to get them furnished with enough roots to enable them at once to lay hold of the soil when put out, which should be in the spring before growth has commenced. The roots ought to be opened well out so as to give them from the first their required position, for if just merely turned out with the ball entire, and the roots undisturbed in the spiral curved form they necessarily have attained whilst confined in a pot, the plants in all probability will make little progress. In training keep the strongest branches the lowest horizontally and allow the weaker ones a more upright position. This will tend to equalise the strength. Keep them stopped sufficiently to cause them to break enough shoots to cover the required space, and to furnish each summer an even clothing of young flowering branches. When this plant is so managed it has not the fault of many climbers in blooming only at the extremities of the shoots, and leaving a large portion at the bottom destitute of flowers. Plants in such a situation can be kept in a vigorous state by the use of manure-water and surface-dressings of rich soil.

INSECTS.—This Cassia is not much subject to the attacks of insects. Red spider will live upon it, for which a regular use of the syringe is the best antidote. Thrips and greenfly are also sometimes communicated to it from other plants, but can easily be destroyed by fumigation or syringing with tobacco-water. Scale will likewise live on it. If it is much affected with this pest the best plan is, to cut well in a short time before growth commences in the spring and wash thoroughly with insecticide sufficiently strong to destroy the scale. Repeat the dressing and brush it into the inequalities of the bark three or four times before the plant breaks into growth.

CELOSIA.

These are tender annuals, mostly natives of India, of which the Cockscomb with its near ally Celosia pyramidalis are the best known and most generally cultivated kinds. Both are useful decorative plants. The seeds should be sown in pans in spring and stood on a hot bed where an intermediate temperature can be kept up; just cover the seed and shade the surface from the sun. When the plants appear stand near the glass, and as soon as they are 3 inches high move them singly into 3-inch pots, and drain moderately. Good turfy loam to which is added one-sixth of rotten manure, some leaf-mould and a little sand, will grow them well. Keep close for a few days and shade slightly from the sun; this is necessary at all times in bright weather, for if the leaves are injured the appearance of the plants is spoilt. Care must be taken that they never want for water, as the leaves will also suffer from this cause. Give air daily, and syringe in the afternoons at closing time; a night temperature of 60° with proportionately more heat in the day will answer for them. When the soil is fairly filled with roots put them in their flowering-pots—8 or 10 inches in diameter will be quite big enough. Continue to treat as before, still keep them close to the glass and attend regularly to giving air, as without this and abundance of light the plants become drawn. As the bloom appears and the soil gets full of roots give manure-water twice a week. When the combs are fully grown the plants may be removed to the greenhouse or conservatory, where they will last fresh for a good many weeks. The pyramidal form, which is much the most elegant and useful, requires to be similarly managed, and especial care should be taken that the treatment is such as to favour short compact growth ; if this is not attended to it is apt to get so tall as to lose much in appearance. It is well to sow seeds of this variety early in spring, again in May, and later on at midsummer; these sowings will give a succession that will keep in fresh condition until the end of the year. The different hues of this plant, from straw-colour and yellow through the various shades of pink and red to brilliant crimson, are very handsome.

INSECTS.—The regular use of the syringe advised will keep down red spider. If aphides make their appearance fumigate carefully.

CELSIA ARCTURUS.

One of the best of a somewhat curious genus of cool greenhouse plants now seldom met with. It is evergreen herbaceous in habit. It can be raised from seeds sown in spring in an ordinary hotbed or greenhouse, and when large enough potted singly and grown on under greenhouse treatment; it will do in either peat or loam. It bears yellow flowers, which appear in spring or summer. A native of Candia.

INSECTS.—If affected with thrips fumigate ; syringe regularly to keep down red spider.

CENTRADENIA.

These pretty dwarf-growing plants, belonging to the Melastomads, are especially adapted for amateurs who have only the convenience of a small stove, as they can be grown and flowered well in 6 or 8 inch pots. The flowers are small and individually of short duration, but they are produced in quantities successionally for many weeks ; the leaves are long and narrow, proportionate in size to the plants, deep green above and violet or deep red on the under surface—in this latter respect the oldest introduced species, C. rosea, is the darkest. The leaf-colouring renders this variety particularly useful for cutting in the winter to mix with flowers, as the leaves retain their colour for a month in water, and although the plants require heat to grow and flower in, the leaves will keep their beauty in a room with little or no warmth. Used in this way, altogether independent of the flowers, C. rosea is one of the most serviceable plants that can be employed for decorative purposes. Its dwarf, compact habit adapts it for standing upon shelves near the glass, and thus placed, it receives that amount of light which is indispensable to induce the free opening of the flowers; for if Centradenias are stood at a distance from the glass, and at all darkened by the shade of other plants, or are put in a house or pit that is dark, the blooms fall off without opening. Owing to this, many have been so disappointed with them as to give up their cultivation, affirming that the flowers dropped unexpanded owing to the absence of sun in winter, whereas failure should be attributed to the plants not having been placed where they can receive sufficient light, and to over-watering at a season when the root action is very slight. Nor are these the only Melastomads that are thus affected, as several of both the stove and greenhouse species are subject to the same drawback if they do not receive sufficient light.

Centradenias will grow in either peat or loam, or a mixture of both, but we have always found that any plant that is at all subject to throw off its flower-buds is more liable to do so when grown in peat, or a mixture containing peat, than when loam alone is used. This points to the greater strength imparted by loam, although peat generally produces freer growth with a larger development of the leaves, and also imparts a deeper colour. Centradenias root freely from cuttings put in in spring or summer when the wood is in a half-ripened state, but it is better to propagate them early. If the cuttings are put in during March in small pots drained, and filled to within an inch of the rim with a mixture of one-third sifted loam to two-thirds of silver sand, and one inch of sand is placed on the surface, they will root in a fortnight or three weeks in a temperature of 70°. Keep them moderately confined, but not too close, or the leaves are liable to damp; when rooted, gradually expose them to the full air of the house, and when the little pots are fairly filled with roots, shift into others 4 inches in diameter, use good turfy loam, pulled to pieces about the size of acorns, and add one-fifth of sand ; place them on a front shelf where they will receive plenty of light, but shade slightly when the sun is powerful. It is not well to grow them in too much heat; an intermediate temperature of 60° in the night, with 10° more in the day, through the summer, is better than a higher temperature, which only produces weak growth—a condition by all means to be avoided. The natural habit is such that little or no support is needed, a single small stick to the main stem being all that is required. Pinch out the points of the leading shoots to induce them to break back and keep compact and bushy. It may be found necessary to repeat this two or three times during the summer. Give them more air than the majority of stove subjects require. This may be managed without interfering with the requirements of other plants grown in the same house by placing them near the spot where air is admitted; but although benefited by a free circulation of the atmosphere, they must not be subjected to draughts. Syringe them overhead every afternoon through the growing season, and close the house early enough to raise the temperature considerably for an hour or two. Give plenty of water at the roots. By the beginning of July they will want moving into the pots in which they are to flower; these should be from 6 to 7 inches in diameter—not larger, for it is essential to have the soil thoroughly filled with roots before the autumn is too far advanced. If this is not the case the wood does not become sufficiently ripe for the production of flowers to the full extent. Give them at this shift soil similar to that in which they were last potted, and continue to treat in other ways as before until the beginning of September, when they will not need to be longer shaded or syringed; afterwards give a little more air, and thereby gradually cause a cessation of growth. As the days get shorter reduce the temperature by degrees, keeping it at 55° in the night, with a slight increase in the daytime. When the flower-buds begin to swell place the plants as near the glass as possible without touching it; this arrangement will have the effect not only of preventing a disposition to premature dropping but of causing the blooms to open of a brighter colour. At this time an application of clear manure-water of moderate strength, once a week, will benefit them. By keeping a portion of the plants somewhat cooler than the others a succession of flowers can be had, and those that have been longest blooming should be used for cutting. There is no necessity for any reluctance in cutting the branches to whatever extent may be required, for it is much better to grow on a fresh lot of plants each year than to keep the old ones. The latter may, however, be used for decorative purposes in a cut state, as above indicated; simply retain a plant or two from which cuttings should again be taken in spring.

C. floribunda. Comes from Guatemala. Its flowers are larger than those of C. rosea, are purplish violet in colour, and are produced in great profusion. The leaves of this plant are also stained with purple on the under surface.

C. grandiflora. A kind requiring similar treatment, yet not so desirable a plant as the two others.

C. rosea. A native of Mexico, whence it was introduced over thirty years ago, and at one time was much more generally cultivated than at present. The increasing demand for cut flowers of a showy description has put it in the shade, few having tried it for the purpose for which it is so well adapted, namely, that of mixing its branches with flowers, with which the colouring and form of the leaves contrast so well.

INSECTS.—Most insects that infest stove plants will live on Centradenias. The regular syringing recommended through the growing season will generally keep down red spider, aphides, and thrips; but when the syringe is found insufficient, they can be destroyed by dipping in a weak solution of insecticide. If mealy bug or scale gets established on the plants, and they are neglected for a time, it is difficult to eradicate them without injuring the leaves; the best way of removing the former is to lay the plants on their sides and syringe freely with tepid water; use a small soft brush for the scale.

CENTROPOGON LUCYANUS.

An evergreen stove plant of comparatively small growth. It is a profuse bloomer,—the current season's shoots are clothed for half their length with quantities of bright crimson tube-shaped flowers that are an inch and a half long, and keep on opening through November and December. During this time it is one of the brightest ornaments of the stove.

It quickly comes to a flowering state, and such examples as can be had from spring-struck cuttings grown on in 6-inch pots are the most useful. The shoots should be supported with sticks for about half their length, and the extremities allowed to arch over; in this position the flowers stand erect above the leaves, and show their bright colour effectively. It seems strange that this plant should be so little known, and so seldom met with, for it is one of the most distinct and beautiful of all quick-growing autumn bloomers. There are a few other species of Centropogon, but this will be found the most desirable.

Its propagation and after treatment are similar to that advised for Eranthemums, which see.

INSECTS.—Aphides are the only insects that much affect this plant; for these fumigate.

CENTROSOLENIA.

Herbaceous stove Gesnerads of secondary merit.

Their propagation and after treatment is similar to that advised for Columneas, which see.

The following are the most effective kinds:—

C. bractescens. Flowers white. From Venezuela.

C. bullata. Flowers yellow. A native of Peru.

CEPHALOTUS FOLLICULARIS.

(The New Holland Pitcher Plant.)

A compact, small-growing, warm greenhouse plant that only attains a height of a few inches, but which is one of the most singular in cultivation. Unlike the Nepenthes and Sarracenias, the extremities of whose leaves, or the leaf entire, form pitchers, Cephalotus produces pitchers from the main stem of the plant independent of the leaves. They are borne on stalks from one, to two, or two and a half inches long, according to the strength of the plant. When strong, and not grown too hot and confined, the pitchers with their curious lids, assume a dark mahogany colour, contrasting in a striking manner with the pale green of the leaves. Cephalotus is often grown in stove heat, which for a time it bears if kept close to the glass, but usually the plants are short-lived under conditions that excite undue growth. At the same time it will generally be found better to keep the plants, until they have got fairly strong, in an intermediate heat, such, for instance, as that of a house where Mexican Orchids are grown. It produces suckers freely when strong, and is propagated from these. In spring they should be detached from the stem with the small roots that in most cases they will have made, and placed singly in the smallest thumb pots. The material in which the plant does best is fibrous peat broken small, and sphagnum chopped fine in about equal parts, with a good sprinkling of broken charcoal and sand; press the soil firm in the pots round the base of the suckers, and give a little water. At once cover close with a propagating glass, and keep them until rooted in a moderate stove heat, shaded from the sun, but not too much darkened. In a month or two the little plants will begin to root freely, and make leaves, after which stand them nearer the glass so as to get more light, and prop the bell-glasses up a little at one side to admit a little air. Keep the material well moistened. A thin shade will be requisite in bright weather through the spring and summer. Winter in an intermediate temperature, and keep the soil always moist. In spring move into pots a size or two larger, and use the same description of soil. As the weather gets warmer keep in a night temperature of about 55°, with 5° or 10° more in the day during summer. Winter as before; again in spring give pots about an inch larger, and now plunge the pots in which the plants are growing in others two or three sizes bigger, filled with sphagnum, pressed hard so that the bell-glass covering each plant can rest on it. This material should always be kept quite damp, and in this way it will preserve a uniform moist condition of the material in which the roots are placed, as well as contributing to moisten the atmosphere surrounding the leaves. Syringe overhead once or twice a week in the growing season. As the plants increase in size and strength tilt the glasses still further so as to admit more air. If they are stood close to the glass at the end of the house where the air is not disturbed the glasses may be dispensed with altogether when the plants get strong; in this way the pitchers are usually higher coloured. However, their bearing exposure in this manner depends on the condition of the house as to atmospheric moisture and the amount of air given; if kept dry and very airy the glasses may be required. The plants having now got strong, they may, after the expiration of the following winter, be grown in a warm greenhouse, where they are generally less liable to get out of condition than if kept continually in much heat. If all goes well they will keep on increasing in size for several years, freely producing offshoots, a portion of which can be taken off and treated as above advised.

INSECTS.—Greenfly is very partial to this plant, getting on the undersides of the leaves, and very quickly causing their destruction, and that of the plants altogether, if not eradicated in time. Examine the undersides of the leaves frequently to see that they are not affected, and fumigate if the insects appear.

CEREUS.

Under this head are comprised a numerous section of the Cactus family, among which are some of the most gorgeous blooming cool stove subjects in the whole range of flowering plants, at one time very much more cultivated than now. In times past, when hothouses were mostly warmed by the old-fashioned flues with the dry heat they gave off, the genus Cactus was largely represented. The flowers individually do not last so long as some others, but when the plants get large they give a succession that keeps on for several weeks. The splendid colours possessed by many of the varieties, comprising the most vivid shades of red and crimson, are unequalled among cultivated plants. Cereuses are of the easiest possible growth, provided that a few essentials to their well-being are kept in view, and they require very little of that watchful attention which many newer and more fashionable introductions demand.

They are propagated freely from cuttings made of good-sized pieces of the shoots after they are fully matured; these should consist of a considerable portion of the preceding season's growth. If taken off in the spring they should be laid on a dry shelf for a few days to allow the base, where severed, to dry up; afterwards put them singly into thoroughly drained pots just big enough to hold them, filled with sandy loam. Place them in a stove temperature, but not shaded or kept close as most cuttings require to be, or they will rot upwards from the base; nor must they have much water until they have made plenty of roots—just as much as will prevent the soil getting quite dry will suffice. After they are rooted keep them near the glass, with all the sunlight available, and also where they will get air daily. An atmosphere less moist than that of a modern plant stove suits them best. When they have begun to grow, put a stick to each to support them, and give water more freely. If the cuttings have in the first instance been put in 4-inch or 5-inch pots, these will be large enough for the first year, as they do not like much root-room. Towards the end of September gradually withhold water, and keep them quite dry through the winter, during which a temperature of from 48° to 50° will answer.

In the spring, about the end of March, cut a small piece off the head of each to help them to break out additional shoots. This may not be necessary with all the sorts, as some will branch freely of their own accord, but in no case have we found stopping the points do any harm. Increase the temperature as the days lengthen, giving a little water at first, and when the shoots have got plump, and growth has fully set in, give more; then move them into larger pots proportionate in size to that of the plants according to their strength of habit. Use a moderate quantity of sand, and some potsherds broken small will help to ensure porosity. Continue to treat them as advised during the preceding summer with plenty of heat and sunlight in the growing season; again dry them off in the autumn, and winter as before. Some of the smaller freest-flowering kinds will yield a few blooms the ensuing summer. The management afterwards required will be of a simple routine character; give more pot-room as the roots need it, but be mindful never to overdo them in this respect. As the plants get large, it will be an advantage with those kinds that require less heat to stand them out during July and August in the open air against a wall in the full sun, giving no more water than is required to keep them from shrivelling; so treated, they will go on and last for many years.

Such species as C. McDonaldiæ and C. grandiflorus, the night-blooming Cactuses, require to be trained to a wall exposed to the full sun in a warm stove, as they need a thorough ripening to enable them to bloom. The former of the two species comes from Honduras, and has yellow flowers; the latter is a native of Jamaica, and bears white flowers of an immense size In addition, the undermentioned are all fine kinds:—

C. flagelliformis. Pink. From Peru.

C. speciosissimus. Crimson. From South America.

C. splendidus. Scarlet. From Mexico.

C. superbus. Red. Mexico.

C. triangularis. White. From the West Indies.

C. Tweediei. Orange. From Buenos Ayres.

Some of the above will succeed with a lower temperature than that of the stove, but all are benefited by considerable heat while growing There is a very large number of known species, but those named will in most cases be found a sufficient selection for ordinary cultivation.

INSECTS.—These plants are little affected by insects, yet aphides will often be found to attack the young growths and the flower-buds; they can easily be got rid of by fumigation. Slugs are very fond of them, and will do serious mischief if not prevented.

CEROXYLON ANDICOLA.

(Syn.: Iriartea andicola.)

A stove species of Palm, that in its native country is a very tall grower, but under cultivation long continues within a manageable size. It is principally interesting from the fact of its yielding a substance containing wax and resin: hence it gets the name of the wax Palm. It comes from New Grenada.

The method of propagation and cultivation will be found under Palms, general details of culture.

CESTRUM AURANTIACUM.

This belongs to a family of plants that are not particularly attractive, with the exception of the species here named, which is an evergreen greenhouse plant from Guatemala. It has pretty yellow flowers produced in autumn, and borne in bunches at the extremities of the shoots like those of Habrothamnus, to which it is in habit very similar. The propagation and after treatment required are identical with those of Habrothamnus, which see.

CHAMÆDOREA.

This genus of stove Palms contains several species that are amongst the most elegant in habit of the whole family. They require comparatively small pots, and such species as C. glaucifolia will grow to a height of 9 or 10 feet in a 10-inch pot.

Propagation and cultivation given under Palms, general details of culture.

C. elegans. An elegant straight-stemmed kind, with long pinnate drooping leaves. Handsome in either a small or large state. It comes from Mexico.

C. Ernesti-Augusti. A comparatively dwarf species; the stem is slender and supports a head of handsome lobed plaited leaves, wedge-shaped at the bottom. From New Grenada.

C. glaucifolia. One of the most elegant of the genus; the thin straight stem carries a well-proportioned head of spreading pinnate deep green leaves, which droop gracefully at the extremities. From Guatemala.

C. graminifolia. A beautiful species with slender straight stem, the leaves are pinnate, the pinnæ narrow and long, drooping in a plume-like manner. From Costa Rica.

C. Wendlandii. An exquisitely beautiful species with straight reed-like stem. Leaves long and pinnate, the pinnæ moderately broad. A good companion plant to Cocos Weddelliana. From Mexico.

CHAMÆROPS.

These are comparatively low growing Palms, with fan-shaped leaves. They are among the most useful of all Palms for decorative use; those named below will thrive continuously in a greenhouse, or in the open air in summer. They are slow growers and are many years before they become too large for keeping in a small house.

The method of propagation and after management will be found under Palms, general details of culture.

C. Fortunei (syn.: C. sinensis). A strong-growing stout-leaved species, that will bear much hard usage; the leaves, which are fan-shaped, deeply divided, and borne on longish slender stalks, assume a horizontal position. It does well out-of-doors, and stands the winter in the southern counties of England. From China.

C. humilis. The only European Palm existent. A beautiful species; the leaves are not near so large as those of the preceding. They are fan-shaped, and deeply divided and supported on somewhat slender stems; they are erect while young, but ultimately assume a drooping position. It freely produces suckers which if taken off will form roots in a brisk heat; it can in this way be increased. There are several varieties of this plant differing somewhat in appearance, but all bearing the general character of the type. Indigenous to Southern Europe.

C. hystrix. A handsome species with pretty fan-shaped leaves; a suitable companion plant to C. humilis. Of South America origin.

C. Palmetto (syn.: Corypha Palmetto). A distinct-looking plant; the leaves of this kind also are fan-shaped and divided at the extremities to a considerable depth. An American species from Carolina.

CHEILANTHES.

A small-growing, but most beautiful genus of Ferns, comprising both stove and greenhouse species. Several of them are among the handsomest of all Silver Ferns; the fronds of C. farinosa are so heavily powdered as to be perfectly white on the under surface.

For propagation and cultivation, Ferns, general details of culture.

STOVE SPECIES.

C. farinosa. East Indies.
C. hirta Ellisiana. South Africa.
C. pulveracea. Mexico.

GREENHOUSE SPECIES.

C. elegans. Tropical America.
C. fragrans. Madeira.
C. frigida. South America.
C. lendigera. Spain.
C. profusa.
C. pulchella.
C. tenuifolia. Ceylon.

CHIRITA.

Low-growing Gesnerads, that take up little room. They are very effective when in flower, and suitable for standing on the front stage of a stove or intermediate house. C. sinensis, and its variegated form C. sinensis variegata, will succeed in a warm greenhouse. They require the same treatment as advised for Gloxinias, which see.

The undermentioned are pretty kinds:—

C. Moonii. Has blue, or purple, and yellow flowers, produced in summer. A native of Ceylon.

C. sinensis. Flowers lilac; blooms in summer. From China.

C. sinensis variegata. A variegated form of the last-named.

CHOISYA TERNATA.

An evergreen shrub, all but hardy in the south of the kingdom, but worth a place in the greenhouse. It produces large, many-flowered, somewhat lax heads of white flowers from the points of the shoots, the individual blooms are in shape like those of an Ixora, but longer and larger; they are sweet-scented. It can be increased by shoot cuttings put in during either spring or autumn, and treated in the way required by other shrubs of partially hardy nature. Introduced from Mexico.

CHOROZEMA.

These are greenhouse plants, and all natives of New Holland or New South Wales; the brilliant coloured blossoms of the varieties most generally found in cultivation render them striking objects when in flower. Their peculiar spiny, holly-like leaves (large for such slender-wooded plants) give them a very distinct appearance, and render them desirable in contrast with the more ordinary forms usually met with in hardwooded plants. There is also very great difference in their general habit, from the comparatively weak-growing C. Henchmannii, the somewhat bushy C. varium nanum, to the strong free-growing C. Lawrenceanum and C. varium Chandlerii. The two latter varieties frequently push shoots 4 or 5 feet in length in one season, and their vigorous growth adapts them either for training bush fashion, as specimens, or for greenhouse or conservatory climbers. In the latter position they look well, not taken up the roof, but trained to wires between the upright sashes; here they should not be kept tied or stopped in too closely, but simply attached to the wires or trellis-work for support, and allowed to droop loosely down. They will continue to flower through the winter and spring months most profusely if well managed. But here they should not be planted out in the borders, as they sometimes are, among plants of much larger growth and greater rooting powers, that rob such things as these of their due share of nutriment, and thereby reduce their existence to a mere struggle for life, which quickly ends in the weakest succumbing. In situations such as those under consideration, they should be grown in pots, in the way described further on, for trained specimens, the difference in their general treatment principally consisting in their being encouraged to make as much growth as possible without much stopping.

In the selection of these and other small hardwooded plants, for growing on, great care should be taken that they are perfectly free from scale insects. Even the least trace of these most objectionable pests should at once suffice to condemn any plant, however strong and healthy in other respects; for although it is possible by perseverance to completely destroy the insects, it is always done with more or less injury to the plants, and the labour it involves costs more than the value of comparatively cheap plants. All the varieties, except C. Henchmannii, will succeed in either peat or loam, or a mixture of both; yet we prefer peat where it can be had good, with plenty of vegetable fibre in it. These plants are quick growers, and consequently will bear more liberal treatment as to root-room than most hard-wooded subjects. Chorozemas strike readily from shoot cuttings; these should be taken off with a heel when in a half-ripened condition, such as obtainable about midsummer. Put several together in 6 or 7 inch pots, keep close, moist, shaded, and under a bell glass or in a propagating frame in an intermediate heat; when fully rooted move them singly into small pots, and as soon as the shoots have begun to extend freely pinch out the points, still keeping the atmosphere a little close, shading, and syringing overhead regularly when the air is shut off in the afternoons. Continue this until the end of August, when give more air and no shade except when the sun is very bright. Keep through the winter at a temperature during the night of about 50°. Towards the end of February move the little plants into 3-inch pots, using soil such as already advised, making it fine and potting moderately firm. Give a little shade as soon as the sun gets more power, and avoid side air until the weather is warmer; syringe overhead in the afternoons later on. Again pinch out the points of the shoots, and keep them stood well up to the glass. By the end of June there should be enough root progress made to admit of shifting them on into 6-inch pots, after which keep the atmosphere a little closer for three weeks, and continue to treat in other respects as before. Cease shading and syringing at the end of August, and winter at about 45° by night. Towards the end of February, give pots 3 inches larger. Let the drainage be ample —say two and a half inches, as from the amount of growth they make when doing well they require a good deal of water, and provision should be made to enable it to pass freely off. Use the soil in a somewhat lumpy state, broken to the size of small walnuts, with one-sixth sand; pot tolerably hard. Tie all the strongest branches out horizontally down to the rims of the pots, and place them in a house where they can be treated to a somewhat close atmosphere of 45° night temperature, with 5° or 10° rise by day. As soon as they show that they have taken to the soil, pinch out all the points of the shoots, and pick off all flowers, so as to direct the whole energies of the plants into growth. By the beginning of May, as the weather gets warmer, syringe overhead every afternoon, keeping the stage (or, what is still better for these plants to stand upon, some medium that will retain moisture, such as fine ashes) damp; through the summer season they will be much benefited by slight shading from direct sun during the hottest part of the day. When the shoots have made 6 inches of growth pinch all the points out, and as soon as they have extended another 6 inches they must again have their points pinched back; this stopping oftener than would be required with most plants, is, with the strongest-growing Chorozemas, a necessity, to keep them bushy and from getting too straggling. If this is not done they will require cutting back, which simply means a waste of time and vigour in the plants. After the middle of August shade no more, but continue the use of the syringe every bright afternoon, until the middle of September; after this they will not make so much growth, but will begin to set their flowers; winter at about 40° by night. From the rapid growth the more vigorous varieties of these plants make, they will by the end of this season be nice decorative examples for the conservatory, or wherever required. They are best trained to a few sticks, just sufficient to give support; wind the strongest branches round them, and leave the weakest to hang loose; do not tie them in too closely. In this way they look much better than if trained too formally. They will begin to open their flowers during the early spring, and will continue for two or three months more or less in bloom. By April this season they should be shifted into pots from 4 to 6 inches larger, and treat them as before; use soil in a little rougher state. Their general management through the summer should be the same, in respect to slight shading, syringing, stopping the shoots and keeping them trained, as last season. If all goes well they will last in good condition for several years without more root-room by the use of clear weak liquid manure-water once or twice a week during their growing season.

If required for exhibition purposes they must be placed, at the beginning of February, in a house with a northern aspect to be retarded, as from their early blooming disposition they would, if left in a house where exposed to the full action of the sun, be past their best before the time required; at the same time they must not here be exposed to too much cold, or they will not flower kindly.

The following varieties are the best of the genus:—

C. Henchmannii. Is quite a different habited plant from the others, having small narrow leaves supported on slender shoots; the flowers are produced in profusion, but are not nearly so bright in colour as the others. It is also a comparatively slow grower. The cultivation of this species is similar to that recommended for the others, except that it does not require so much stopping; and we have found it do best in peat and sand alone.

C. Lawrenceanum. A tall-growing variety; if grown as a trained specimen it must be diligently attended to in stopping the shoots, or it will get straggling.

C. varium Chandlerii. This is a free

strong grower, with long racemes of particularly bright yellow and red flowers, produced freely and lasting for a long time in beauty. One of the best.

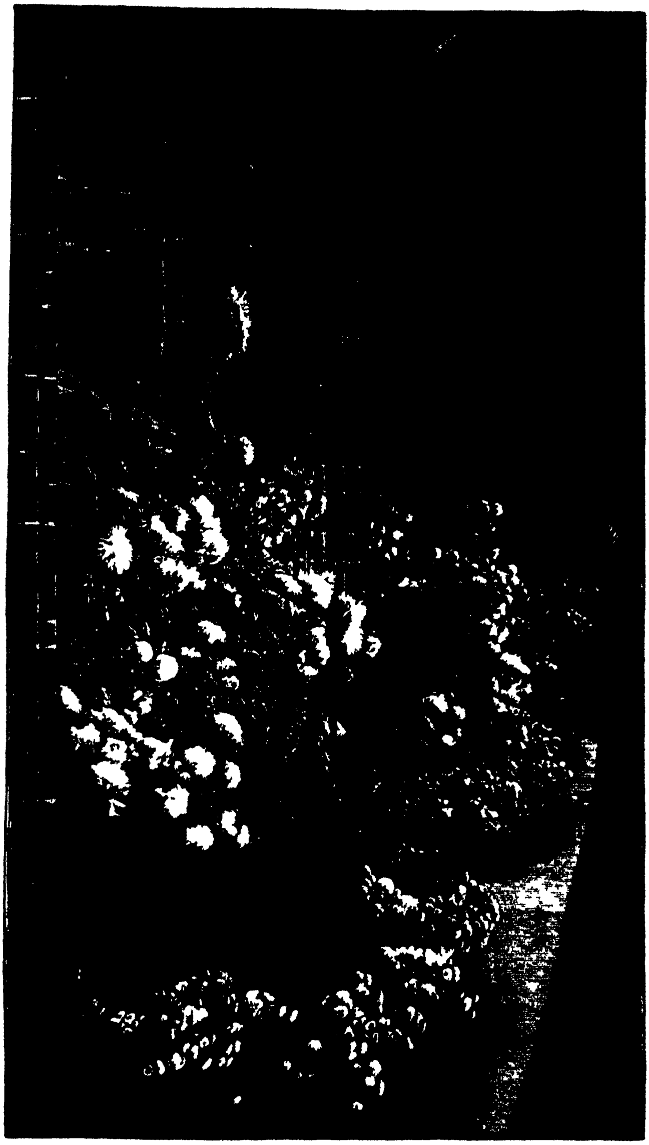
C. varium nanum. A much more compact-habited plant, requiring little stopping to ensure a sufficiently compact growth. It has fine, glossy, Holly-like leaves, larger than most of the other varieties. A profuse flowerer, and altogether a very desirable plant.

INSECTS.—So far as we have been able to observe they possess a complete immunity from mildew, otherwise they would be ill able to bear the continued use of the syringe through the whole of the growing season, which is an absolute necessity to keep down red spider. To this latter they are more than ordinarily subject, and if allowed to get ahead upon them, it will quickly cause quantities of their leaves to fall, after which they seldom do much good. This pest is not confined to the under surface of the leaves of these Chorozemas, as in the case of the majority of plants affected by it, but establishes itself equally on the upper portion, necessitating a thorough application of water to every part of the plants. In addition they should be frequently examined through the growing season, and if found affected with the insect should be at once washed with a weak solution of insecticide; afterwards continue the use of the syringe with clean water. If brown scale happens to get established upon them, the best plan is to cut back all soft growth, and wash with insecticide, which should be used strong enough to kill the insects; repeat the dressing in eight or ten days, before the plants have pushed any fresh growth. Greenfly will sometimes establish itself on the points of the shoots; fumigating is the best remedy, the plants, from their hard foliage, standing it sufficiently strong to destroy the insects.

CHRYSANTHEMUM.

The Chinese and the Japanese Chrysanthemums are too well known to require describing, and we need only point to their beauty and extreme usefulness, thriving as they do freely with ordinary attention, and blooming profusely during the last months of the year, when there is comparatively little in the way of flowers to enliven our plant-houses. In more recent years the Japanese varieties, with their elegant tasseled flowers, have come much into favour, and are likely to continue so, as they are devoid of the somewhat ball-like formality which the ordinary large-flowered kinds possess. Chrysanthemums are among the easiest to grow of all flowering plants subjected to pot culture, yet they are not always seen so well managed as they should be. There are few plants that require such liberal feeding, and it is more to the absence of a sufficient supply early enough in the summer than to any other cause that the unsatisfactory condition they are often seen in is attributable. They strike readily from cuttings made of the young shoots that are produced freely at the base of the plants; they may be struck either in the latter months of the year or towards spring. In most cases the earlier period will be found best; about November select stout shoots that have not been drawn up weakly through the plants being too much crowded. Put them singly in small pots, or several together in larger ones, three parts filled with fine loam, sand, and a little leaf-mould, with a layer of sand on the top; stand the cuttings on a moist bottom in a cool house or pit that can be kept at a greenhouse temperature, cover with a propagating glass and keep moist. Here they will root in the course of six weeks without the tops being at all drawn in the way that is unavoidable when they are subjected to heat. As soon as the cuttings are well rooted remove the glasses, and put them singly in 3-inch pots, using soil similar to that in which they were struck, but with less sand in it; when top growth fairly begins pinch out the points of the shoots, and treat generally, in the matters of air and water, as required for other softwooded greenhouse plants. About the end of March move them into 6-inch pots, well drained, using soil well enriched with rotten manure; in April put them in a cold frame or pit, where they can be kept close to the glass and have plenty of air, with means to just keep out the frost on the sharp nights that often come about that time. At the beginning of May inure them to the open air by taking off the lights in the daytime; a little later on stop the shoots, and stand the plants out in the full sun, with the pots plunged in ashes, not too close together. In June, before they get at all pot-bound, move the plants into their blooming pots, which may be from 10 to 12 inches in diameter, according to the size they are intended to be grown to. Use plenty of drainage material, and do not make the soil too fine; put more rotten manure in it than most plants would bear, and a good sprinkling of sand.

Tie the shoots well out to sticks so as to keep the centres of the plants open, and plunge the pots in ashes, standing them far enough apart to prevent their being in



CHRYSANTHEMUMS AND OTHER PLANTS IN THE CLOISTERS AT FORDE ABBEY. *To face page* 104.

any way drawn. Syringe overhead every afternoon in dry weather; see that the soil never gets dry so as to cause the leaves to flag in the least, and in six weeks after ing begin to give manure-water each alternate time they require watering, using it somewhat weak at first and stronger as the season advances. See that the shoots are kept well supported with sticks strong enough to prevent their being broken by the wind. In Autumn as soon as the buds are large enough to admit of thinning this must be attended to or the flowers will be small. It is not well to take the plants indoors sooner than necessary, but do not let them remain out to get frozen. When housed they must not be stood too close, and should have plenty of air day and night, with a little heat turned on if the weather is frosty.

If very large flowers of the large varieties are required the plants should be confined to from three to five shoots each, with all the buds removed except one to each shoot. If miniature plants in small pots are wanted, it is best to plant some out in the open ground early in summer, and when the flowers are set bend the shoots down and layer them in the soil; in a month or five weeks they will have made enough roots to allow of their being cut from the old plants and put in 6-inch pots, and if well supplied with manure-water they will bloom well.

LARGE FLOWERED, INCURVED VARIETIES.

Beverley. Creamy white.
Bronze Jardin des Plantes. Bronze and yellow.
Empress of India. White.
Fingal. Rosy violet.
General Slade. Indian red, and orange.
Golden John Salter. Golden yellow.
Golden Queen of England. Canary yellow.
Guernsey Nugget. Yellow.
Hermoine. Blush white.
Jardin des Plantes. Bright golden yellow.
Lady Hardinge. Rose pink.
Lady Slade. Lilac pink.
Lady Talfourd. Rosy lilac.
Lord Derby. Dark purple.
Mr. George Glenny. Straw colour.
Mr. Gladstone. Chestnut red.
Mrs. Dixon. Yellow.
Mrs. Halliburton. Sulphur white.
Mrs. Rundle. White.
Prince Alfred. Rosy crimson.
Princess Teck. White.
Princess of Wales. Pearl white, with lilac tint.
Queen of England. White.
White Globe. White.
White Venus. Pure white.

LARGE FLOWERED, RECURVED VARIETIES.

Annie Salter. Golden yellow.
Christine. Peach.
Dr. Sharpe. Crimson.
Golden Christine. Golden buff.
Julie Lagravère. Velvety crimson.
King of Crimsons. Crimson.
Prince Albert. Crimson.
Progne. Amaranth.

ANEMONE FLOWERED.

Astrea. Lilac blush.
Empress. Lilac.
Fleur de Marie. White.
George Sand. Red, centre gold.
Gluck. Golden yellow.
Grace Darling. Blush lilac.
Jean Hachette. White, centre yellow.
Lady Margaret. White.
Louis Bonamy. Lilac.
Marguerite de York. Sulphur yellow
Marie Stuart. Blush lilac, centre sulphur.
Marquise de Croix. Blush lilac.
Miss Nightingale. Blush, centre white.
Mr. Astie. Golden yellow.
Mrs. Pethers. Rosy lilac.
Prince of Anemones. Blush.
Princess. White, shaded lilac.
Princess Marguerite. Lilac pink.
Reine des Anemones. White.
St. Margaret. Bronzy orange.
Virginale. Pure white.

POMPONES.

Andromeda. Creamy white.
Bob. Deep crimson.
Crimson Perfection. Bright crimson.
Dupont de l'Eure. Golden yellow.
Golden Mademoiselle Marthè. Yellow.
Lilac Cedo Nulli. Rosy lilac.
Mademoiselle Marthè. Pure white.
Marabout. White.
Salamon. Rosy carmine.
Snowdrop. White.
White Cedo Nulli. White tipped.
White Trevenna. Pure white.

JAPANESE.

Blanche Fleur. Blush changing to pure white.
Bronze Dragon. Bronze yellow.
Chang. Orange red and yellow.
Dr. Masters. Red and gold.
Elaine. White.
Emperor Nicholas. Red and gold.
Fair Maid of Guernsey. Pure white.
Gloire de Toulouse. Amaranth, white, and crimson.
Golden Dragon. Yellow.
Hero of Magdala. Bright red and orange.

James Salter. Lilac.
Madame C. Andiguier. Rosy lilac.
Madame Godillot. Brownish red.
Madame B. Rendatler. Yellow, shaded rose.
Mademoiselle Anna Delaux. Milky white, tinted rose.
Meg Merrilies. Sulphur white.
Rob Roy. Reddish purple and amber.
Wizard. Reddish maroon.

EARLY FLOWERING POMPONES.

Bois Duval (syn.: Scarlet Gem). Maroon red.
Chrome Stella. Yellow.
Early Casse. Lilac rose.
Fred Pelé. Reddish crimson and gold.
Golden Madame Domage. Golden yellow.
Hendersonii. Yellow.
Illustration. Light pink and orange.
Le Luxemburg. Bronze yellow.
Madame Desgrange. White, centre yellow.
Nanum. Blush.
St. Croutts. White, pink tipped.
St. Mary. White.

INSECTS.—Aphides are often troublesome, and as soon as the plants are found to be affected they should be fumigated, or dipped in tobacco water. The leaves are also sometimes attacked by a grub which affects them in the same way as the larva of the celery fly, getting between the upper and lower cuticles of the leaves; directly this pest is seen it must be crushed with the fingers or it quickly spoils the plants. If mildew is troublesome dust with flowers of sulphur.

CHRYSANTHEMUM FRUTESCENS.

These, the Marguerites of the French flower markets, are pretty free-blooming plants. Their flowers are well adapted for various purposes in a cut state, and the plants are equally so for the decoration of greenhouses. Their propagation and after growth is of the easiest possible description; cuttings made of the points of the soft young shoots will strike at any time of the year in a week or two in warmth; if put in about the end of February in sand, and kept close and moist in a temperature of 60° they will strike in ten days. As soon as they are well rooted move singly into 3-inch pots, pinch out the points of the shoots, and keep them in a temperature similar to that in which they were struck; give air according to the state of the weather, with a little shade when the sun becomes powerful. In a month or six weeks they will need more room. They will flower in 6 or 7 inch pots if required, or, if larger specimens are wanted, they may be at once put in 8 or 9 inch pots; if to be grown large, the shoots should again be stopped. By midsummer they will have grown to a handsome size, and will keep on blooming continuously all on through the autumn and winter if kept in a temperature of about 45° or 50°. They will grow in any kind of soil, peat, or loam, with some rotten manure and sand added. They do well struck in spring, planted out in the open ground about the end of May, and lifted and potted towards the beginning of September; so treated fine specimens for winter blooming can be depended on.

There are many forms of both the white and the yellow varieties, nothing more than differences in the seedlings. It is best to get a free-flowering, compact-habited variety of each colour, and propagate successional stock each year to take the place of the old ones to be discarded after flowering.

INSECTS.—Aphides are the only insects that affect these plants so as to give much trouble; for these fumigate.

CIBOTIUM.

A magnificent genus of Ferns, most of which are Tree species that will thrive in a greenhouse temperature, but are better with the atmosphere kept a little closer and more humid during the growing season than that of a greenhouse. C. Barometz has creeping stems, and if planted out will cover a large space with its stately fronds, the texture of which is such that they will last in good condition for a very long time; few Ferns will keep fresh so long in water when cut. It comes from China.

For propagation and cultivation, see Ferns, general details of culture.

GREENHOUSE SPECIES.

C. Barometz. China.
C. pruinatum. Sandwich Islands
C. regale. Mexico.
C. Schiedei. Mexico.
C. spectabile. Mexico.

CINERARIA.

In times past the raising of new varieties of this useful greenhouse plant was confined to a few individuals, and propagation by suckers was the usual course adopted by the generality of cultivators. But in recent years so much improvement has been made in Cinerarias, that they may be had good enough for all purposes from seed saved from carefully-selected plants of a good strain; this method also gives much less trouble than in the case of increase by suckers, and the plants are more vigorous.

When required for early flowering—say to come in at the beginning of the year—the seed should be sown about the end of March in pans, drained and filled with soil composed of three parts good fibrous loam, sifted, to two of leaf-mould, with a good sprinkling of sand added. Press the soil moderately firm, and sow the seeds evenly and not too thickly, or the young plants get crowded and drawn up before they are large enough to transplant. Just cover the seed with fine soil, and press it slightly; stand in a temperature of 55°, where the sun will not reach the soil so as to make it necessary to give much water before the plants vegetate. As soon as they appear place the pans as near the glass as they can be got, shade slightly from the sun, and give a moderate amount of air, which increase as the seedlings gain strength. When the young plants are big enough to handle prick them out three inches apart in pans, or shallow boxes, filled with soil similar to that in which the seed was sown, and treat as before. Give shade when necessary, with air through the day and plenty of water to keep the soil moist. Before they get crowded move them singly into 4-inch pots; use soil as before, but it should not be sifted, and should contain a little less sand. An ordinary garden frame will now be the best place for them; stand it so as to face north, in which way the sun will not have so much power on the glass. Keep close for a few days until the roots get hold of the new soil, after which give air freely and shade from the sun in the middle of the day; give plenty of water, and syringe overhead in the afternoons. Cinerarias are quick-growing and free-rooting plants, and must not be allowed to remain in the pots they now occupy until the roots become matted, or in anything approaching a pot-bound condition, or they cannot afterwards be got to move freely. Consequently when the soil is fairly filled with roots they must be moved to their blooming pots; such as are 6 or 7 inches in diameter will be quite large enough, provided the plants are attended to with manure-water as they require it. Without a liberal supply of this they cannot be had in such a good condition. Some rotten dung may at this point be added to the soil, and the pots should be drained well. In a few days after potting the lights should be tilted back and front in the day so as to allow plenty of air, and be removed altogether in the night when the dews will benefit them; keep the material on which the pots are stood during the summer always damp, syringe the plants overhead in the afternoons, and as soon as the roots have got fairly hold of the soil give manure-water at each alternate watering.

In the cultivation of Cinerarias it is all through the several stages of their growth necessary to stand them sufficiently far apart to prevent their being at all drawn, for should this occur, the large bottom leaves which add so much to their appearance and are equally essential to a strong vigorous condition are sure to die off before the time of flowering. Directly there is any danger of frost they must be moved to where it cannot reach them, but they should if possible not be stood on dry shelves or stages as they dislike a dry atmosphere, and this also is injurious to the leaves. Standing the pots through the winter as hitherto advised on ashes or other material that will hold moisture, will do much towards keeping them free from insects and preserving the lower leaves. In a temperature of 40° to 45° in the night, the earliest will come into flower by Christmas; those that show a disposition to be later will do with a temperature of from 35° to 40°. For spring blooming a second lot of plants should be raised; the seed should be sown about the end of May, and the treatment in other ways be as recommended for the earliest.

If it is intended to save seed the plants that bloom in spring should be closely looked to as flowers begin to open; select the best forms and most distinct colours, and as soon as any of decided merit appear at once remove them to small frames, each colour separate, and all at some distance away from the general collection. By this means and this alone can the strain, even if good to begin with, be kept up to the required standard. Should any varieties appear of extraordinary merit they may be propagated by division of the suckers which the plants produce after flowering; put them singly in small pots and keep close until established, after which treat as advised for the stock raised from seed.

INSECTS.—Cinerarias are very subject to greenfly, which establishes itself on the undersides of the lower leaves and increases apace. The stock should be often examined, and immediately the aphides are found on a plant it should be dipped in tobacco water, which will be found a much better as well as more expeditious way of dealing with the pests than allowing the whole to get affected before taking means for their destruction. Fumigation with tobacco will kill them, but the leaves are often injured in the attempt to destroy the insects. Thrips and red spider are sometimes troublesome, but rarely affect them if the cultivation is such as advised. Dipping in a weak solution of insecticide will kill the spider; fumigate for thrips.

CISSUS.

(Stove.)

Among all the variegated stove plants that have been introduced to this country there are few, if any, that have attracted so much attention as Cissus discolor, the exquisite markings of its leaves being very handsome. It is a climber, easily propagated, and its subsequent management is equally easy. Cuttings made of the young shoots, consisting of some three or four joints each, put singly into small pots in sand and kept in a close, moist atmosphere in a brisk heat form roots quickly, after which they should be inured to the air of the house and moved into proportionately larger pots. Use good open rich soil – either peat or loam will answer—as the plants are such free-rooters that they grow and do well in anything, provided it is not retentive of moisture, so that the large quantity of water they need can pass freely off.

If to be trained on trellises they should not be put on these until in the pots which they are for some time to occupy; consequently, in their younger stages, the shoots should be trained round a few sticks till they are large enough to be placed in the pots in which they are to be confined. One stopping will generally be sufficient to cause enough shoots to break to furnish the specimens sufficiently. A brisk stove temperature, with shade when the sun is powerful, is requisite to grow them well; shade is especially necessary in the case of C. discolor, the variegation of which cannot be preserved if the plants are too much exposed to the sun. Large pots are required to grow the more vigorous kinds, such as C. discolor, which will fill a 12-inch or 15-inch pot in six or eight months after it is struck. When to be planted out so as to cover a pillar or portion of a wall in the stove, for which purpose they are well adapted, the plants may be turned out as soon as they have filled 6-inch pots with their roots. In all stages of their growth they require to be plentifully supplied with water and syringed overhead daily during the growing season. In the winter they may be cut in freely to keep their heads in bounds. If grown in pots, they may, as soon as they have broken again into growth, be partially shaken out and fresh soil given. When planted out they soon exhaust the material in which their roots are placed, and should be assisted by surface dressings of good loam, enriched with decomposed manure. The plants can be used for filling large baskets for hanging up, where they can be kept in a stove temperature, without which they make little progress.

There are a number of species in cultivation, but the undermentioned kinds are the ones that find most favour with the generality of cultivators:—

C. discolor. This is a climbing plant from Java, of very free growth, with oblong cordate leaves, deeply ribbed, ground colour deep green, beautifully marbled with white, and while young with pinkish red.

C. gloriosa. Another free-growing climber, with velvety green leaves, veined with red. Introduced from Costa Rica.

C. Lindeni. Also a climber, like C. discolor, with tendrilled branches; the leaves are medium-sized, bright green, mottled with white. It comes from Colombia.

C. porphyrophylla. A free grower, very suitable for covering a wall in a hothouse where there is not so much light as most plants require. A native of India, not nearly so handsome as the preceding.

Insects.—Thrips, aphides, mealy bug, and scale will all live on these plants, but the daily use of the syringe will usually be found sufficient to keep the least troublesome in check, and should bugs or scale affect them sponging must be resorted to.

CISSUS.

(Greenhouse.)

Most of this genus are stove species, but there are a few that will thrive with greenhouse treatment. They are climbing plants, and have handsome foliage; the flowers are insignificant.

The mode of increase is by cuttings struck in spring in the usual way; when they are rooted pot them, and grow on in moderate heat until they have got well established, after which give pot-room as required until they are large enough for planting out in the positions they are to occupy.

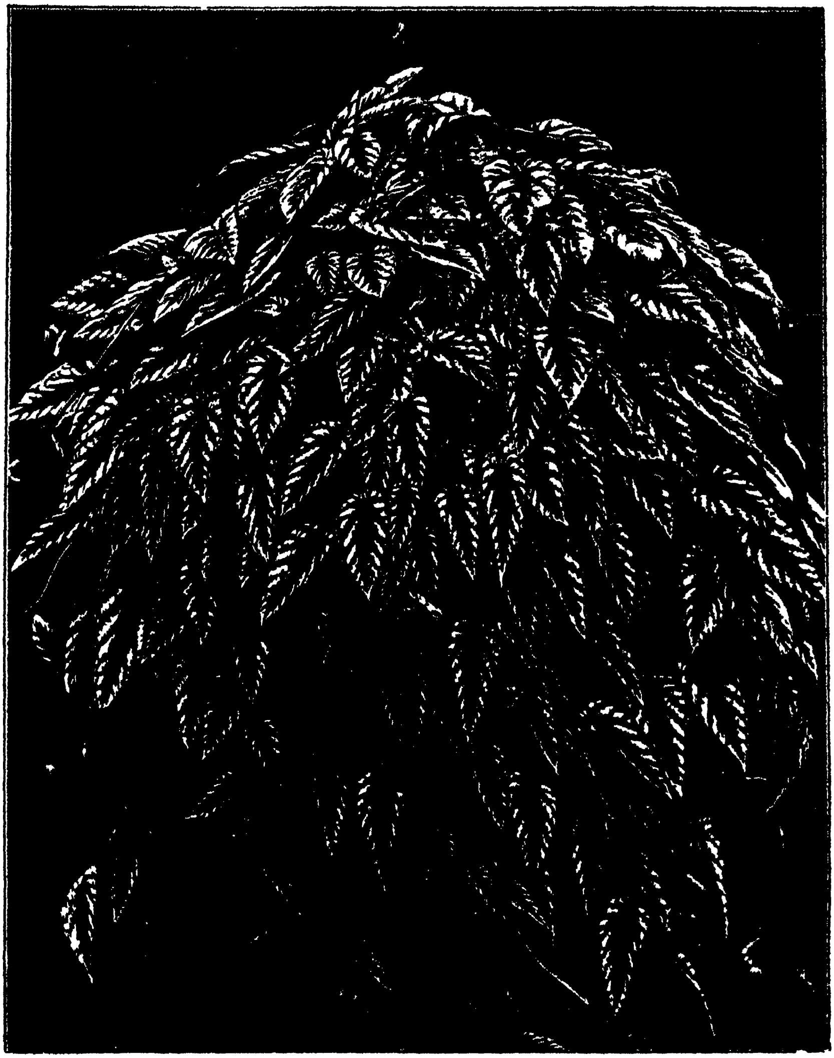
The following are the most suitable for growing in this way:—

C. antarctica. New South Wales.

C. capensis. Cape of Good Hope.

C. quinata. Cape of Good Hope.

Insects.—Aphides are frequently troublesome on the young shoots; as soon as discovered they must be destroyed by fumiga-



CISSUS DISCOLOR.

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tion, or they will disfigure the leaves, for the appearance of which alone the plants are grown. Syringe daily through the summer to keep free from red spider.

CITRUS.

The Common Orange and the more ordinary kinds of the Citrus family, are too well known to require any description here. The plants of the different kinds, from the large Shaddock to the small Otaheite Orange, are very ornamental, either in bloom or bearing their beautiful fruit. Large healthy examples in either condition are amongst the most attractive plants that can be used in a conservatory.

They are mostly increased by budding or grafting on stocks raised from the seeds of any of the freer-growing species, performing the operation in the ordinary manner; but most growers will find difficulty in proceeding this way, and would prefer commencing with established plants, which if healthy and vigorous will grow fast if kept in sufficient warmth. Supposing that such are obtained early in spring in 8 or 9 inch pots, they should at once be examined, and if more root-room is required they ought to be moved to larger pots, being careful not to give too much room; good rich yellow loam, to which has been added some rotten manure and sand, will answer. Although the different kinds of the Orange family are often grown under cool treatment, such as in company with greenhouse plants, yet they do very much better if kept warmer both summer and winter; about 50° in the night in the latter season with a little more in the day; and a night temperature of about 60° or 65° in summer, with 10° or 15° or a little more in the daytime, in very hot weather, will answer. In this way they will thrive much faster and have a better appearance. If after potting they are put in a temperature such as here indicated, they will grow apace, syringing freely every afternoon, and giving a thin shade when the sun is powerful. Should any of the shoots show a disposition to take too much lead they should at once be shortened so as to distribute the strength evenly through the branches, giving air daily according as the state of the weather permits, with water when the condition of the soil is such as to require it. Admit still more air in autumn, reducing the temperature through the winter to the point named above.

Such of the plants as have filled the soil with roots should again be moved in spring to pots 2 or 3 inches larger, raising the temperature as before through the growing season, and treating in other respects as in the previous summer. By continuing this course the plants will grow fast, and in a few years attain a handsome size. With fair usage, Oranges are among the longest lived of all cultivated plants. Where there is not the means of giving them warmth as above advised, they can be grown under greenhouse conditions, but the progress will be slower; when kept in a low temperature through the winter corresponding caution must be used in watering them. During the growing season, soot water in a clear state, given once every three or four weeks, is a great assistance to the plants, not only by invigorating them, but it likewise rids the soil of worms, which if present do much harm.

The following are desirable kinds:—

C. Aurantium. The sweet-fruited Orange.

C. Aurantium Bigaradia. The bitter Orange.

C. Aurantium sanguinea. The Blood Orange.

C. decumana. The Shaddock.

C. japonica. The small Otaheite Orange.

C. Limomum. The Lemon.

C. nobilis. The Mandarin Orange.

INSECTS.—Oranges are very susceptible to the attacks of insects, particularly scale, which should be carefully removed by sponging. Should mealy bug become troublesome, sponge and syringe. The use of the latter will generally be sufficient to keep them clear of other pests.

CLAVIJA.

Evergreen, low-growing stove trees, only suitable for a large house, where there is room to admit of their being seen in something approaching their true character.

They are increased by shoot cuttings, which should be put in to strike towards the end of summer, when the wood is approaching maturity; the cuttings ought to consist of the points of the shoots, with three or four leaves attached, and should be put singly in pots large enough to hold them, filled with sand, kept close, moist, and shaded in a temperature of 60° until the base is callused, when they may have 75°. By spring the pots should be sufficiently full of roots to admit of their being moved into larger ones; they will thrive in good turfy loam, with enough sand added to keep it open; this is essential, as with these and similar plants there is no chance of the old soil being replaced with new, as any attempt at shaking out the roots would end in disaster. Give ordinary stove treatment through the summer in respect to heat, moisture, and shade, which latter should not be used further than to keep the leaves from scorching. Syringe the plants freely daily until autumn, when admit more air to solidify the growth. Winter at 60° in the night, with 5° more by day; give larger pots in spring, and treat through the summer as advised for the preceding year. All subsequently required is to continue the course so far indicated, giving more root-room until the plants are large enough to turn out in a bed of well prepared soil, or move into large tubs that will hold sufficient material to support them for some time, to assist which give manure-water once a week through the growing season.

The following two species are both handsome

C. macrocarpa (syn.: C. macrophylla). Has white flowers; it blooms in autumn A native of Peru.

C. ornata. A yellow-flowered species that blooms in autumn. From the Caraccas.

INSECTS.—Scale and mealy bug will thrive apace on these plants; if the latter is troublesome, syringe freely with insecticide. To remove scale, a hard brush should be used to the old wood, sponging the young growth and leaves.

CLEMATIS INDIVISA.

This is a strong-growing, very handsome evergreen greenhouse climber, bearing white flowers in great profusion during the spring months. It is from New Zealand, and is a very suitable plant for a large house, where a considerable space has to be covered, and where it has room to develop itself sufficiently to exhibit its natural character. It is a free-rooting subject, and requires to be planted out, as no ordinary sized pot could contain enough soil to support the growth which it makes; but in commencing with young plants it is better to grow them on for a time in pots, so as to get them well furnished with roots before turning out into a prepared border.

This Clematis will strike from cuttings, but much the best method of propagation is grafting small bits of the shoots on pieces of root of any strong-growing kind; this should be carried out early in the spring, keeping the grafted plants in a warm, confined atmosphere until a union is effected, and they have begun to make growth, after which they must be gradually inured to more light and air, and kept on in a growing temperature until there is enough solar heat to keep them growing freely through the summer; move them into larger pots as these are required, training the single shoot which each young plant should have to a stick. Keep through the autumn and winter in an ordinary greenhouse; in April move into pots 3 or 4 inches larger, stopping the points of the shoots. The plant grows well in a mixture of half peat and loam, with a moderate quantity of sand added to it. For this, as for other free-rooting things, it is well not to make the soil too fine; break the turfy pieces into bits the size of walnuts, and mix the sand well with it. After potting insert in the pots several tall sticks, round these twine the shoots, which should be confined to from one to three in number, so that the plants may be induced to make considerable progress during the season. When potted place them in an ordinary greenhouse, and encourage growth by the usual means of damping the atmosphere in bright weather, and shutting up early with sun-heat, as also syringing freely overhead. Beyond this nothing will be required through the growing season except keeping the shoots regularly trained round the sticks. If this is not attended to they get entangled in a way that renders it difficult afterwards to separate them. As autumn approaches give more air, and discontinue the use of the syringe. Winter the plants in the usual greenhouse temperature of about 40° in the night Warmer than this they should not be kept, or they will be induced to make growth through that which ought to be a season of complete rest previous to planting out. This will be understood from the plant being indigenous to a country where the winters are cool. Prepare the border in which they are to be planted by efficient drainage, well-secured from the soil getting down into it by a layer of fibrous material, than which for a strong-growing subject of this description there is nothing better than a thin, turfy sod of about an inch in thickness that has lain together sufficiently long for the grass to have become decayed. This, if put on the turfy side downwards, will for years exclude the finer particles of soil from getting down into the drainage, which is better for being some 6 inches in depth. Previous to planting out this and all other climbers, especially in greenhouses and conservatories, care should be taken that they are perfectly free from any of the worse kinds of insects, such as scale or mealy bug, for, if plants to occupy a

CLEMATIS INDIVISA LOBATA. *To face page* 110

position over the other occupants of the house such as these roof-climbers are at all infested with these pests, as a natural consequence they affect every plant standing under them that the insects will live upon, entailing an endless amount of labour. The position of plants thus trained on the roof renders them much more difficult to clean than when grown as ordinary pot specimens; it is equally of importance that any plants at all affected with these insects that are introduced to the house in which roof-climbers are grown should never be stood in contact with the stems of the climbers, for if so placed the pests are sure to be communicated to them, the worst results of which must follow. Let the planting-out be done sufficiently early in spring, before any growth has commenced, so that the necessary disentangling of the roots from the ball of earth with a view to spreading them in the new soil, can be carried out without injury, which would follow if growth in either roots or branches had begun. After planting give no more water until they have commenced to grow; this is necessary to keep the soil in a suitable condition. During the growing season keep the shoots regularly tied up into the place allotted to them, and supply the roots with water. This Clematis is very appropriate for planting at one end of a house, and training under the ridge. When allowed to hang thinly in festoons it has a good effect, and is more fitting for being so grown than things which are not naturally calculated for extending far. As the soil in which the roots are placed gets exhausted, recourse must be had to stimulants in the shape of copious waterings during the growing season with liquid manure and renewal of the surface soil in the spring by removing an inch or two from the top of the border the roots occupy, and replacing it with new. When the space is filled which the plants are intended to occupy, each year, after flowering, the knife should be freely used so as to reduce the shoots within proper limits, and to allow room for the season's growth.

INSECTS.—Red spider will, during hot weather, sometimes make its appearance on this Clematis, and should be guarded against by a free use of the syringe. Brown scale can be removed by sponging in the usual way. If white scale gets upon this, or any plant grown overhead on the roof, there is no chance for its extirpation except cutting the head close in during the winter when at rest, and dipping or washing the affected stem and remaining shoots with a strong solution of insecticide.

CLERODENDRON.

There are three very distinct sections of Stove Clerodendrons; one consists of deciduous twiners, of which C. Balfouri may be taken as a representative; a second is C. splendens, which is also a twiner, but differs from the last-named section in being evergreen and in requiring different treatment; then comes the third division, which consists of evergreen shrubs very distinct, and which need treatment different from the others. A selection from these sections may with advantage find a place amongst the best collections of plants; they have much to recommend them, inasmuch as they grow freely, and succeed with less attention than most things, not being impatient of either drought or moisture to such an extent as the generality of cultivated plants. The Chinese C. fragrans is one of the sweetest-scented flowers grown. Another advantage which Clerodendrons possess is, they can be flowered in either a large or small state, several of them being alike suitable for twining round a pillar or for draping a rafter. Where room is a consideration, there is another property possessed by the shrubby species that is deserving of attention; it is the way in which they may be cut in every autumn, so as to occupy little room during the winter; not only will they bear this treatment without injury, but to keep them in their wonted shape it is necessary to so reduce their size as to literally head them down.

As regards cultural requirements, let us commence with the shrubby kinds, of which we may take C. fallax as a good representative. This is a vigorous growing shrub, with ample lively green leaves, supported on stout petioles 8 or 10 inches in length; above these, from the points of the current season's shoots, spring the flowers, which are bright scarlet in colour and borne in very large stately, erect panicles, 10 inches in diameter and a foot high. This sort strikes readily from cuttings, which can generally be obtained about the end of June. When they can be got 6 inches long they should be taken off with a heel and inserted singly in 3-in. pots in half sand and finely-sifted loam; the soil ought to be kept moist and the propagating glasses sufficiently close to prevent the leaves flagging; these, from their size and somewhat soft texture, will not bear so much air as some kinds of foliage until roots are formed. They should be in a temperature of 70° at night, and allowed 10° more in the daytime during bright weather. The cuttings will root in a few weeks, when the glasses may be removed and the plants placed for a week or two into a light situation; they should then be moved into 6 or 7 inch pots, according to the quantity of roots which they are found to have made when turned out of the cutting pots. Let them be potted in good fibrous loam, not broken too fine. To this should be added one-fifth rotten manure and an equal quantity of sand; make the soil quite firm in the pots, and place them on a shelf as near the glass as they can be got. This is important in order to keep them dwarf and short-jointed, upon which in a great measure depends their good appearance afterwards more than in the case of most plants; if allowed to become at all drawn no subsequent treatment can furnish them with stout, healthy leaves down to the pots until they have been headed down, which would entail the loss of a season. They must never be allowed to suffer from want of water, or the leaves will be injured. Syringe freely every afternoon both the upper and under surfaces of the foliage; they will require slightly shading in very bright weather until the middle of September, when it should be discontinued; give more air and reduce the temperature to 65° at night, and proportionately low during the day, lowering it 5° more as the days get shorter. During winter little growth will be made, and correspondingly less water must be given; but as these Clerodendrons do not require the wood to be ripened so much as that of most plants, they must never be allowed to get too dry at the roots, so as to cause the leaves to flag, or they will be injured. Keep them where they will have plenty of light, and continue this treatment until the middle of February, when the temperature should be raised 5° day and night, and the plants moved into 10-in. pots, now using the soil in larger pieces than before, but with a similar quantity of manure and sand added. After this be careful not to give too much water until the roots have got well hold of the soil; towards the latter end of March raise the temperature 5° more, and begin to syringe overhead in the afternoon. They will now grow fast, and should have a little air in the daytime; as the sun gets powerful a slight shade will also be necessary in the middle of the day. They make roots freely, and by the end of May they should be moved into 13-in. pots, which size will be large enough for the present season, using soil such as that recommended for the previous shift. The temperature may now be kept at 70° in the night if the plants are required to flower early in the season, but with this heat they must be placed near the glass and be allowed a moderate amount of air every day. About the end of June they should show bloom, when they may have manure-water given twice a week. In a few weeks the flowers will commence to open; the plants can then be moved to the coolest end of the stove, or if a house is available where an intermediate temperature is kept up they may be removed to it, which will prolong their time of blooming. When the flowering is over, if the spikes are cut out at the bottom just above where they spring from the upper leaves, and the plants are again subjected to a brisk heat, they will push up one or more shoots from the points from which the flower-stems were removed, and will bloom again in September; after this they may be cut down to within 8 or 10 inches of the bottom, and should be kept at about 65° at night and a little higher in the daytime, syringing daily, but not giving much water to the soil until they have again begun to grow; the temperature may be lowered as in the preceding autumn, wintering them as before. As the days lengthen give them more warmth; in March take them out of their pots and remove one-third of the old soil, putting them in others 2 or 3 inches larger; press the soil moderately firm, and treat them in every way as during the previous summer, except that they will not require potting a second time; they will flower again twice, but they must not be cut back after the first blooming further than just removing the flower-stems. Plants thus treated will last for years, and may, if desired, be grown in 18 or 20 inch pots, in which way they will attain a large size, bearing eight or ten spikes of bloom at a time.

C. Kœmpferi. This handsome South American species bears scarlet flowers. It (and also C. fallax) can be raised from seeds sown as soon as ripe in autumn; but in order to obtain them the first flower-stems of the season must not be removed but allowed to remain on the plant until the seed is matured. Sow the seeds singly in small pots, covering them with a quarter of an inch of soil. They will soon vegetate, and will require treating in every way similarly to young plants raised from cuttings.

C. fragrans fl.-pl. This is a weaker growing plant than the preceding, producing close, compact heads of pinkish white double flowers, so highly and agreeably scented as to be preferred by many to those of Daphne indica, Tuberose, or the old Clove Carnation. It requires similar treatment to the two first-named kinds, but does not need so much root-room. It is a native of China. All the above are sufficiently stout in their habit of growth not to need any support beyond a single stick to each shoot.

C. splendens. This is an evergreen twiner of moderate, but not very quick growth. The flowers, which are deep scarlet, are produced in slightly drooping panicles from the young wood, and are very handsome. This species is well adapted for clothing a pillar or rafter, and looks well trained on a moderate-sized wire trellis. It is from Sierra Leone, and can be propagated by means of cuttings, but these require to be selected with judgment, as if made from hard, wiry shoots, they do not either root or grow freely, and, on the other hand, if too soft they generally damp off. The best cuttings are those obtained from a strong, mature branch that has been cut back. The young shoots that afterwards break from it should be taken off with a heel when about 8 inches long. These can be got in the summer, and will root in sand. They should be placed singly in small pots under a propagating glass in a temperature of 75°, and when well-rooted they should be moved into 6-inch pots in fibrous peat, to which has been added one-sixth of sand. When they begin to grow place a stick in each pot for support, giving them a light situation, with air every day, and shade when the weather is such as to require it, syringing overhead when the house is closed until autumn. Reduce the heat 5° day and night as the sun gets less powerful, and in winter a night temperature of 60° will be sufficient. About the middle of February give them 5° more warmth, which will induce the roots to move, and a month afterwards shift them into 10-inch pots, again using good peat and enough sand to keep it open; pinch out the points of the shoots in order to induce them to break back During the spring and summer they will bear a temperature of 70° at night, giving air when the thermometer rises to 80°; shade in sunny weather during the middle of the day, and syringe freely overhead when the house is closed, which should be done early in the afternoon. As the growth requires support, put in each pot four or five sticks, round which train the shoots, but do not allow them to become entangled one with another, which often happens if not attended to. Keep them in these pots during the season, again lowering the temperature in autumn, and discontinue the use of shading and syringing; winter as last year, gradually raising the temperature when the days lengthen sufficiently to require it. About the same time in spring shift them into their flowering pots, which for this first season should be 13-in. ones; put them in soil similar to that previously recommended, and place a wire trellis to each plant, over which train the shoots evenly. Give heat, shade, and air as during the previous summer, and also water to the roots and overhead. By midsummer they may be expected to show flowers, which will continue to open and remain in good condition for several weeks, during which time the plants may be placed where they can be kept a little cooler, but they must not be put where they will be subjected to draughts or to too low a temperature, or the flowers will fall off before they open. Keep the shoots regularly trained as hitherto. After the blooming is over, they may, if too full of growth, be slightly cut in and kept through the autumn and winter as before. Again about the time that growth is commencing the plants should be turned out of their pots, removing any loose soil that may exist, but they must not be shaken out, as is often done in the case of deciduous subjects, or the leaves will suffer; move them into pots 3 inches larger, using soil the same as previously, and treating them in every way similarly. They will last for many years by removing a little of the surface soil each spring without disturbing the roots too much; they will also be benefited by receiving manure-water in the growing season. When this Clerodendron is used as a climber it is better to grow it in a pot, as from its moderate habit of growth the roots are not so well calculated for planting out. C. speciosum, which is a handsome variety of C. splendens, may be treated in every way like it.

C. Balfouri. Among deciduous, twining Clerodendrons this is much the best. It is a vigorous, quick grower, and may be either planted out or grown in a pot, for which latter purpose it is well adapted either for flowering in a small state, or for growing into large specimens. It strikes freely from cuttings, which should be taken off with a heel as soon as they are 8 inches long, and if the plants have been started about the beginning of February, the cuttings will be large enough to take off by the end of March. Put them singly in 3-inch pots, filled with two-thirds sand to one of loam, sifted fine. Being very soft, they require to be kept moist, or they will flag if much air is given. Keep them until rooted under a propagating glass in a night temperature of 70°, with a little more heat during the day. Give just as much air as will prevent damping. They will root in a very short time, after which place them where they will receive a fair amount of light for a few weeks; then move them into 6 or 7 inch pots. The soil should consist of four parts good turfy loam to one of rotten manure and sand in equal quantities; press it firmly in the pots, and pinch out the points of the shoots to induce a branching habit; let them have plenty of light, and water freely. When the roots have begun to move well they will bear a temperature of 70° at night and 10° higher with sun heat, syringing overhead at the time the house is closed. When the shoots have grown three or four joints past the point at which they were first stopped, they should be again stopped. By the end of July they will want moving into 10 or 11 inch pots, but this time do not break the soil fine; each pot should now have four or five sticks, a yard high, placed just inside the rim round which to train the shoots; very little shade is required, full exposure to the light being necessary to induce their flowering profusely. Give a moderate amount of air all through the summer, and increase it in September, at the same time discontinue the use of the syringe. About the close of the month water should be withheld from the soil until the leaves flag considerably, after which give a little to freshen them up, again allowing the soil to become dry, so as to cause the foliage to droop before water is applied. Keep on repeating this process, which will stop further extension of the shoots, harden up the wood, and ultimately cause the leaves to turn yellow and fall off; after that reduce the temperature to 55 during the winter, giving no more water than will just keep the soil slightly moist. When starting them into growth, which may be at any time from the end of February to May, they must have the ball of earth well moistened at the time when they are subjected to a higher temperature. This will be best managed by soaking them in a pail of tepid water, letting them stand, pot and all, in it for twelve hours. After this raise the heat 5°, at the same time training the shoots neatly round the sticks. When they have made a few inches of growth the temperature may be raised to 65° at night, giving 8° or 10° more during the day. Syringe regularly overhead in the afternoon. In a few weeks they will show flower, which will grow rapidly, and as a rule begin to open in eight weeks from the time when the plants were first started. If bloomed early it will be necessary to keep them in a temperature similar to that in which they have been brought on, but if not flowered until later they may be moved when in bloom to a conservatory, where they will last in good condition for several weeks. After this they can be at once shifted into 16 or 18 inch pots. The shoots should then be untied from the sticks, cut back to 4 or 5 feet in length, and each plant trained near the roof in a house or pit where they will receive plenty of light, with a temperature during summer such as that of the preceding season, treating them in other respects similarly, and drying them off in autumn as before. After this a strong wire trellis should be fixed on each pot, over which the shoots may be evenly tied. Winter in a similar temperature, and again bring them into flower when required. After blooming this season they should be well cut back, turned out of their pots, and one-third of the ball of earth removed, replacing them in the same pots in new soil, and growing them through the season, as recommended for the last. They will now be benefited by manure-water when growing; managed in this way, they will last for several years. If required for planting out, they should have a well-drained border in which there is not too much room for the roots, or over-luxuriant growth may be the result. The soil ought to be similar to that which has been advised for pot-culture, drying the plants off similarly in autumn. After the first season a little of the surface soil should be removed each year, replacing it with fresh material and giving manure-water liberally; prune well in each season after flowering. C. Thomsonæ and C. Rollissonii will succeed under the same treatment.

Insects.—As regards insects, deciduous Clerodendrons are not much subject to them. Red spider will sometimes make its appearance, and if not removed soon injures the leaves. For this the best preventive is a free use of the syringe. The shrubby species are often attacked by both brown scale and mealy bug, but diligent use of the syringe and sponging will keep them in check. When they are headed down affected plants should be well washed with insecticide. The large-leaved kinds are sometimes infested with red spider if the undersides of the leaves are not kept well syringed. C. splendens and C. speciosum should be treated in a like manner if troubled with insects.

CLETHRA.

Handsome evergreen shrubs that grow to a considerable size; very effective either in or out of flower. Suitable for a large greenhouse or conservatory.

Clethras are increased by cuttings of the three-parts ripened shoots, put in about August, several together, in pots filled with sand, kept moist, shaded, and covered with a propagating glass, in a temperature of 65°. When rooted move them singly to 3-inch pots in peat and a little sand, and keep them a little close for a few weeks until the roots have begun to move freely. Then dispense with the glasses and reduce the heat somewhat for the winter—say to 55° in the night—but it will be well to keep them at about this for the first season, as they will then attain a much better size than if allowed to remain stagnant until spring. About April they will most likely require moving into pots 2 inches larger, using soil similar to that given at the first potting. If a little more warmth than that of a greenhouse can be given the plants until the end of May it will be an advantage. Now stop the shoots; let them have plenty of light, with air and a little shade when the sun is bright, syringing overhead every afternoon. During the summer an ordinary greenhouse temperature will suffice, as also through the autumn and winter. Again in spring give them a 2 or 3 inch shift, according to the progress made. Keep a little close for a week or two, and then treat as recommended the previous summer. After this all that is necessary is to give pot-room as required so as to get the plants on in size, as they are much more effective then than while small. They will last for many years if given enough root-room and manure-water in the growing season.

The following kinds are the most suitable for greenhouse cultivation :—

C. arborea. Flowers white, blooms in summer or autumn. A native of Madeira.

C. arborea minor. A smaller growing variety of the above ; the flowers are similar, and it blooms at the same season. Madeira.

C. ferruginea. Flowers white, blooms in summer and autumn. Introduced from Peru.

INSECTS.—Aphides sometimes attack the young shoots ; to destroy them fumigate. Should scale be troublesome sponging must be resorted to.

CLIANTHUS PUNICEUS.

This, the Glory Pea of New Zealand, is a most distinct and handsome as well as free-flowering evergreen greenhouse plant. It produces its splendid crimson-coloured, singularly-shaped flowers freely in bunches, almost as large as an epaulette, during the summer months, at which time it is a very suitable subject for conservatory decoration, where it will last for a considerable time in bloom, and is not so liable as some other things are to be injured by being for a time somewhat confined. It possesses also the great recommendation of having a good constitution, it is a free grower, and does not often get out of health. Good sandy fibrous loam will grow it well ; peat may be used if the former is not at hand, but where loam such as above described can be had, it will induce a freer disposition to flower.

This Clianthus is easily increased from cuttings of the young shoots, taken off when 4 or 5 inches long, with a heel—these may usually be had in right condition about May. Put them singly in small pots filled with sand, and kept close, moist, and shaded in an intermediate temperature, they will root by the middle of June, when inure them to more air and less shade. In the course of a month they should have made enough roots to bear moving into 4 or 5 inch pots ; pinch out the points of the shoots, after which continue to keep them warm and moderately close, so as to encourage both root and top growth. Give a little shade when the weather is bright, and syringe overhead in the afternoons. At the end of August give more air, and cease shading and syringing so as to get the growth solidified. Through the winter the usual greenhouse treatment as to warmth, air, and water will suffice ; about the beginning of April the roots will commence to move, and they may be turned out of their pots and their condition examined. If well rooted give a 3-inch shift ; this will be enough, for, although, as has been above stated, the plant is a good grower, it does not make roots in such quantities as some subjects of even smaller growth. Let the soil be well broken by hand, and as much sand added as will keep it in the requisite porous state ; drain the pots sufficiently and make the soil moderately firm, then at once tie the branches well out.

It is of a somewhat stiff erect habit of growth, and, unless the training is attended to in the early stages, it becomes difficult subsequently to deal with and liable to break. From this cause the plants generally seen are somewhat leggy and soon get bare at the bottom, a condition that cannot afterwards be corrected. At the time it is thus tied out take off the points of the leading shoots, place the plants in a pit or house, amongst any ordinary young hard-wooded stock, where they will be kept a little close for a short time after potting, when they may be given a fair amount of air in the early part of the day; close the house in good time in the afternoons, and syringe them freely always when the air is shut off. This must not be omitted after growth has commenced and the weather gets at all warm, as they are very subject to red spider; but, by timely and continuous syringing through the summer, no inconvenience will be experienced; turn them round once a week, so that they may get their leaves regularly wet on all sides. They will probably not require anything more, except a regular supply of water to the roots when the soil seems to want it; do not let the latter become so dry before water is given as is necessary with plants of a more tender nature.

If any shoots show signs of out-growing the others pinch out their points; give more air by the middle of August, but keep on using the syringe until the end of September—it will not induce a soft condition of the wood, as with some things, and as this Clianthus is not much liable to mildew no harm will be done by the continued use of water overhead. Winter them as advised for the preceding season, and again pot in the spring; this time, if they have done well, they will require a 3-inch shift, with soil as before recommended. Still keep the shoots trained out, using a few neat sticks to keep the branches in their wonted position, but it is a plant that does not need much support; treat after potting and during the summer as last year. They will most likely flower from the principal shoots in July or August, consequently these must not be stopped, or the blooming will be interfered with; when in flower they can be placed in the conservatory, where their bright-coloured blooms, different in every way from most of the other occupants, will make them noticeable. After they have done flowering shorten the strong shoots back, and treat as during the previous autumn and winter. Again move them in the spring, giving pots as much larger as last season; this summer the plants will make a good deal more growth, from the increased root-power which they have attained, and will produce more flowers. If the pots are well filled with roots the ensuing spring, and it is deemed advisable to grow them into large specimens, they may be again moved into bigger pots; but if moderate-sized plants are preferred give manure-water once or twice a week, and in the spring remove 2 or 3 inches of the surface soil, and replace with new, to which has been added one-fifth of rotten manure: treated thus they will last for years.

This Clianthus makes a good plant for covering a back wall or clothing a pillar, either planted out or grown in a large pot, the principal thing being to keep it well and regularly syringed all through the growing season. Handsome as it is, with many growers it has got into bad repute, because it is subject to red spider; this, if allowed to accumulate upon it, makes the leaves shabby and prevents free growth, yet nothing more is required to dislodge it than the free use of the syringe, as already advised.

C. magnificus differs little in its flowers from the preceding, but is of a rather more vigorous or larger habit of growth. It requires the same treatment in every way, and is in some respects a better plant for training to a pillar or similar situation; like C. puniceus, it must have a free application of the syringe.

INSECTS.—These Clianthus are not much troubled with insects, except scale and spider, as already mentioned; if they get affected with brown scale they should be occasionally well sponged over, and in the winter, when at rest, syringed with insecticide. If the white species of scale gets upon them there is no recourse but heading back into the hard wood when the plants are in a dormant state, and washing repeatedly with a strong solution of insecticide. Should they be attacked by aphides, fumigate.

COBÆA.

Where quick-growing evergreen greenhouse climbers, such as will cover a large space in little time, are required, these plants suit. Although their flowers are not showy they are borne in the greatest profusion, and from their graceful drooping habit of growth they are very effective. Cobæas may be propagated either from seeds or cuttings; if the latter course is adopted pieces about 3 or 4 inches long should in spring be taken off with a heel and put in small pots in a mixture of sand and loam, in moderate heat under a bell-glass. Kept moist and shaded they will root in a short time, and when the soil is fairly filled with roots move them into pots 6 or 7 inches in diameter, using ordinary sandy loam well enriched with rotten manure. Each plant should have a tall stick to support the shoots; after they have begun to grow freely a greenhouse temperature will be best; give air daily and water sufficient to keep the soil moist, and sprinkle overhead every day with the syringe. By the end of July the plants should be large enough for turning out where they are intended to be grown. They will thrive in either peat or loam, and should have the bed or border in which they are planted confined to from 18 to 24 inches square (except where a very large space is to be covered), otherwise they grow so fast as to be unmanageable. Little further is required except training the shoots as they grow, so as to fill the desired space, and cutting the plants in freely each spring to keep them within bounds.

The following are the kinds usually grown:—

C. scandens. A quick grower, with purple-tinted flowers. Mexico.

C. scandens penduliflora. A strong-growing, drooping-flowered kind.

C. scandens variegata. A variegated leaved variety, with pretty foliage.

INSECTS.—Free syringing all through the summer is generally sufficient to keep them clear from the usual pests. If affected with any of the more objectionable parasites, wash with insecticide when cut back in the winter.

COCCOCYPSELUM REPENS.

This is an old, creeping, evergreen stove plant. It is only worth growing for its berries, which are effective, and deep blue in colour. The shoots being of creeping or trailing habit, render the plant suitable for growing in hanging baskets, in which way its pretty berries are best seen. It is easily managed, and can be increased by shoot-cuttings struck in spring, and grown on in moderate stove heat, giving additional pot-room as required. It comes from the West Indies.

COCHLIOSTEMA JACOBIANUM.

In this valuable introduction from Ecuador we have a stove plant not only of distinct and stately appearance but of remarkable beauty. It resembles a Bromeliad with a very short stem. Its leaves grow to a length of from 2 to 3 feet, and they are 7 inches broad at the widest part. They are arranged somewhat closely in a tuft-like form, springing from the short stem, which gives the plant the appearance of a huge Tillandsia. They are spreading, slightly recurved, and of a somewhat pale green colour, their appearance being much enhanced by the beauty of the large spikes of flowers which are produced freely from their axils. A strong specimen will continue blooming, more or less, for three or four months in succession. The flowers may be described as of a bluish-violet, and are borne upon smooth, stout pink stalks from 12 to 18 inches in length and as thick as a man's finger. These are furnished with pale pink bracts from 3 to 4 inches in length by 2 inches in breadth, which, contrasting with the flowers, produce a charming effect, altogether different from anything else. It usually commences blooming in spring, the particular time, of course, being influenced by the condition of the plant and the temperature in which it is grown. In addition to its fine appearance it possesses the good properties of not being difficult to manage, and it can be placed in a conservatory when in bloom during the summer months without sustaining injury therefrom, when care is taken not to allow it to stand in a draught or too near where air is admitted. At the same time with this, as with most other stove subjects, it does not under such conditions make much growth, and consequently must not receive too much water; for although it delights in plenty of moisture when in active growth in a moderately high temperature, an over-wet condition of the soil when there is little root development going on is calculated to endanger its health. For a considerable time after its introduction its high price, owing to the slow rate of its increase, kept many from growing it, but now that it is cheaper it ought to find a place in even the most choice collections. It has an agreeable, but not over-powerful perfume.

It may be propagated by means of suckers, which are produced near the base of the plants. These, when sufficiently strong, may be taken off in the spring, stripping off a few of the under leaves, and placed singly in pots proportionate to their size in soil consisting of half sand and loam; they will soon root in a temperature of 70° kept moderately, but not too, close. When sufficiently rooted, the young plants should be gradually exposed to the full air of the house, giving them plenty of light, but not direct sunshine. They should, however, by no means be shaded by other plants, for if so they will never make enough roots to support a vigorous head of leaves, without which the plant cannot be seen in its best condition. When the pots are moderately filled with roots shift into others 7 or 8 inches in diameter. It will succeed in a mixture of two-thirds good yellow turfy loom and one of fibrous peat, to which a liberal admixture of sand, broken crocks, or charcoal should be added, and a little chopped sphagnum. Drain the pots well; crocks to one-fifth of their depth will not be too much, as, in common with other things of a kindred nature, it cannot bear stagnant moisture in the soil. The temperature during summer may be kept at from 65° to 70° by night, air being given in the day when it rises by sun heat to 80°, and the house closed in the afternoon while the sun is up; sprinkle overhead at the same time with the syringe. As autumn advances give more air and less shade, discontinue syringing, and reduce the temperature, keeping it through the winter at about 60° in the night and 5° higher during the day, giving considerably less water to the soil. Increase the heat 5° at the beginning of March, and when growth has fairly commenced shift the plants into pots 4 inches larger than those they now occupy, using soil in a more lumpy state than before. In re-potting do not disturb the roots more than can be avoided, but merely remove the drainage material from the bottom of the balls. As the weather gets warmer raise the night temperature to 65° or 70°, with a proportionate increase by day, attend to air and shade as required, and again syringe overhead when the house is closed in the afternoons. Under such conditions the plants will grow apace, and when the roots have got a good hold of the soil they must be liberally supplied with water. Most probably a few spikes of flowers will make their appearance this season, but these are of secondary importance, as the aim of the cultivator should be to grow the plants to as large a size as possible during the summer. No attempt should therefore be made to move them from the stove when in bloom during the present season. About July they ought to have another shift, this time putting them in 15 or 16 inch pots, with similar soil and, as before, plenty of drainage. Give less water for two or three weeks until the roots penetrate the new material, after which treat in every way as in the early part of the summer. As autumn advances again reduce the temperature and dispense, as before, with the use of the syringe and shading; also maintain a drier condition of the atmosphere, and winter them as previously. In spring again increase the temperature, and give additional water, with shade as required. If all has gone well, and the plants have made the progress which they ought to have done, they will begin to push up their flower-spikes about the beginning of May, producing from a dozen to a dozen and a half at or near the same time. It will be better not to move them to cooler quarters until midsummer, as while the spring growth is somewhat tender and the nights cold they will be liable to suffer in a way of which there will be no danger later on in the season; the successional flowers which they will produce will render them an acceptable addition to the conservatory, where they may remain up to the end of August, being placed again in the stove before the weather gets cool. Winter as previously, and in the spring, before growth has commenced, turn them out of their pots and work away as much of the soil from the upper portion of the ball as can be done without injuring the roots to any extent; regulate the drainage, add new soil, and put the plants back into the pots out of which they were turned, unless there is a desire to grow them on to a very large size, in which case they may be shifted into others 2 inches larger. Treat during the summer as in the preceding one, but this season give them a little weak, clear manure-water once a week; this will compensate for the want of additional root-room. Their autumn and winter management should be the same as before, in spring removing some of the old soil, giving fresh material in its place, and again assisting them with manure-water. When suckers are made they should, as they get large enough, be removed and struck, as already recommended; these will take the place of the older plants when they get shabby in appearance.

INSECTS.—The character of the leaves of this Cochliostema and the continuous use of the syringe during the growing season keep down, as a rule, the smaller kinds of insects that affect the occupants of the stove; if scale makes its appearance it is easily removed by sponging, and mealy bug can be washed off by syringing with tepid water.

COCOS.

A very beautiful and also interesting genus of stove Palms, from the fact of one of the species, C. nucifera, yielding the Cocoa Nut of commerce. In addition to this some of the species are so extremely elegant in appearance as to be ranked amongst the most select of cultivated plants.

For propagation and cultivation, see Palms, general details of culture.

C. elegantissima. A remarkably elegant species that attains a medium size: the leaves are pinnate, the pinnæ narrow; the stem is slender, and this, combined with the plume-like character of the leaves gives the plant a beautiful appearance. From South America.

C. nucifera. The species from which the edible Cocoa Nut is obtained. In a state of nature it is not usually found far from the sea. It is a handsome plant, but requires much room if grown sufficiently large to exhibit its true character. From India.

C. Weddelliana. One of the most beautiful of all Palms, resembling much in general appearance the most elegant-habited kinds of Chamædorea. The stem is slender, the leaves pinnate, pinnæ long and very narrow, foot-stalks short: collectively this plant has a charming appearance. Rio Negro.

COFFEA.

The Coffee of commerce. Both C. arabica, a native of Yemen, and C. liberica, from Liberia, are handsome evergreen trees, interesting on account of the immense extent to which the berries are used in so many parts of the world.

They are easily raised from seed, which should be sown in shallow pans filled with a mixture of sifted peat and sand, standing the pans in a temperature of 70°. When the plants come up place them near the light. If the seeds are sown during the latter end of summer the plants may remain in the seed-pans until the following spring, when they must be moved to 3-inch pots, in soil similar to that in which the seed was sown; as solar heat increases raise the temperature, giving air daily, with a little shade, and syringing overhead freely in the evenings. Through the latter part of spring and summer a night temperature of 70° with 15° more in the day will be found suitable; winter at about 60°. In spring again give larger pots, and raise the heat as in the preceding year; during the season of active growth give water freely, and apply less in winter. A continuance of the treatment so far advised is all that is necessary, with additional pot-room as found requisite. The plants attain considerable size if sufficient head-room and root-space are given them. The flowers, which are white, are interesting as well as the berries. The two kinds are much alike in their habit of growth.

Insects.—Scale is the worst insect to which these plants are subject; sponging is the best means of keeping it down. Mealy bug, which will also live on them, can be removed by laying the plants on their sides and syringing freely with tepid water.

COLEONEMA.

There are two or three kinds of Coleonema in cultivation, C. album, C. rubrum, and C. tenuifolium. They are low-growing evergreen greenhouse shrubs, from the Cape of Good Hope, with small insignificant flowers. They are now seldom met with, being of little value from a horticultural point of view. They will succeed under treatment similar to that advised for Adenandras, which see.

COLEUS.

Softwooded stove plants, so well-known for the exceedingly bright colours of their leaves as to require no comment here, further than saying, that the varieties raised from seed in recent years possess colour such as can scarcely be surpassed. Their colour, combined with the excellent habit of the plants, the ready way in which they may be propagated and afterwards grown on, and their adaptability for decorative use, renders them indispensable. They may be struck from shoot-cuttings at any time of the year in heat, confined in a close moist atmosphere and shaded from the sun; when they are rooted they must be potted on in rich loamy soil with some leaf-mould added. Give pots proportionate to the size the plants are required to be grown to, and shade slightly from the sun in very bright weather, but at the same time give plenty of light, with enough air to keep the shoots from getting drawn.

The following are fine kinds:—

C. Allan Chandler. Maroon, crimson and green leaves.

C. Cannell's Lovely. Ground colour crimson, with chocolate and green markings.

C. Conrad Rosenthal. Leaves a mixture of yellow, red, green, and maroon.

C. Ethel Baxter. Cream colour, bright green and carmine.

C. Ernest Benary. Yellow, crimson and green.

C. Fair Maid of Kent. Scarlet and yellow.

C. George Simpson. Maroon and crimson.

C. Harry Veitch. Yellow, green, and chocolate.

C. Illuminator. Green, magenta, and maroon.

C. John Benary. Bright scarlet and yellow.

C. Maggie. Crimson, yellow, bronze, and green.

C. Miss Rosina. Yellow, maroon, crimson, and pale green.

C. Mrs. Baxter. Crimson and green.

C. Mrs. George Simpson. Deep crimson and mulberry colour.

C. Mrs. Knatchbull-Hugessen. Gold and deep maroon.

C. Pompadour. Pink, with white and green marbling.

C. Reine des Belges. Carmine, light green, and maroon.

C. Troubadour. Bright green, creamy white, and crimson.

INSECTS.—Few insects affect these plants, their sap being of too crude a nature to be palatable to the parasites. Aphides sometimes make their appearance, for which fumigate, and if red spider is at all troublesome syringe freely with clean water.

COLUMNEA.

These are remarkably free-growing and equally free-flowering stove Gesnerads that continue in bloom for a long time. Plants of a scandent habit when grown with nothing to cling to or to support them naturally droop, and become suitable for hanging baskets. Many that possess this form, however, grow too long and straggling to be of use for cultivating in this way; hence it is that we have not too many that can be made to adapt themselves to this purpose. On this account one of the Columneas, C. scandens, is valuable for suspending in the stove or intermediate house, where its bright tube-shaped flowers show themselves off to the best advantage. They bloom for a considerable time during the summer and autumn.

Cuttings made of the points of the shoots taken off in April, put singly in small pots in sand, placed in a propagating frame in ordinary stove heat and kept moist, will strike in a short time, as they emit roots not alone from the joints, but all up the stem. After they are rooted treat them like the general occupants of the stove as to warmth, water, air, and shade; the last they do not require so much of as more delicate plants; and they should receive only what is found necessary to keep them from getting scorched. Pinch out the points of the shoots as soon as they have begun to grow, after which move them into 6-inch or 7-inch pots, which will be large enough for the first summer; in July again pinch out the points of all the shoots and repeat the operation later on in the summer if the growth made is such as to require it, the object being to keep them as bushy as may be. Reduce the heat in autumn; a temperature of about 60° will suffice through the winter. In spring, about the end of March, those that are intended for growing in baskets should have those prepared for them; they may consist of the ordinary rustic pattern, made of wood, or of iron wire. They can be lined with moss, and then have the plants turned out into them in the usual way, or they may be moved to larger pots and plunged in moss within the baskets; in either case the baskets should be of a good size, as the plants are free growers. If to be grown in the ordinary way they will require 12-inch pots; use good turfy loam with a little sand and leaf-mould, and again stop the shoots. They will need more warmth as the solar heat increases, with a plentiful supply of water when free growth sets in. The shoots should then be supported with sticks and ties; if in baskets, as a matter of course they will require to be allowed to hang down. It would not be advisable to again stop them, as this would interfere with their blooming. Treat generally as during the preceding summer.

The flowers are produced at the axils of the leaves, and have a very distinct and handsome appearance; individually they are not unlike single blooms of some of the larger Gesneras. When they have done blooming, the branches should be cut close in, after which keep them moderately warm, so as to encourage them to break into growth; winter as before. When they are inclined to start in spring, turn them out of their pots, remove a considerable portion of the old soil and replace it with new. The pots they have occupied last summer will be big enough, unless very large plants are wanted, in which case they must have more room. As soon as the soil has got well filled with roots give manure-water; this will support them without the necessity for large pots. After the second year's flowering they may be discarded, and young stock struck to take their place.

The family is limited to a few species, the two best of which are:—

C. erythrophæa, which has long-tubed red flowers, and is a native of Mexico, and

C. scandens, which bears bright scarlet flowers, and comes from the West Indies.

INSECTS.—The hairy stems of these plants afford shelter for mealy bug, which will live upon them, but the texture of the stems and leaves is such as to admit of their being freely syringed with tepid water if they happen to get affected, laying them down on their sides at the time.

COMBRETUM PURPUREUM.

This belongs to a somewhat numerous family, mostly evergreen twiners from hot regions, but it is the only one that has found favour with plant growers. It does not get so large as many stove climbers, and on that account is more suitable for places where the space that can be afforded to it is limited. Its flowers, which are very handsome, are borne in large, spreading, fan-shaped sprays a foot in length and nearly as much in width; the colour, reddish crimson, is rich and deep; the flowers are individually small, but they are produced in large numbers, standing close and erect on the upper surface of the spike, which assumes a horizontal position. The plant is suitable for twining round a pillar, clothing a rafter, or training as a specimen on a trellis. In the latter case it can be used when in bloom for decorative purposes in a warm conservatory or heated Fern house; yet it must not be subjected to draughts in a cool house, as it is essentially a warm stove plant, coming from the hot, moist regions of Madagascar, and therefore cannot bear for any length of time either a low temperature or a dry atmosphere.

It is increased by cuttings, which by many are found rather difficult to strike. The strong young shoots are somewhat pithy, long-jointed, and liable to damp off. If cuttings made from growth of medium strength that has got two-thirds ripened are in the summer put singly in small pots, filled with clean sand, placed in a brisk heat moderately moist and kept close, they will callus in a few weeks and ultimately emit roots. As soon as these exist in sufficient quantities to support the cuttings, they should be gradually inured to air by tilting the propagating glasses by degrees until they can be dispensed with altogether. The young plants should be kept at the warmest end of the stove, and when they have got enough roots to bear moving, ought to be put in 4-inch or 5-inch pots. The soil should consist of good fibrous peat, without anything added, except sufficient sand to ensure its keeping for years quite porous. This latter is essential, as the plant, from its evergreen character, cannot bear shaking out like some things. The soil must be kept moist, but not too wet. Syringe daily overhead, and slightly shade from the sun until the middle of September, when both may be dispensed with till the spring. As the days get shorter reduce the temperature, which may be kept during the season of rest at 60° to 65° in the night, with 5° higher by day. Less water should be given through the winter. About the middle of February let them have a little more heat day and night, but do not pot them until the roots have begun to move freely, as they do not require nearly so much root-room as some plants. At the beginning of April they may be moved into pots 3 inches larger, giving them soil similar to that in which they were potted before. They should now have a few neat sticks inserted in the soil, round which to be trained. They ought to have their points pinched out, so as to induce them to make several shoots. The night temperature further on may be raised a few degrees, and in the daytime be allowed to run up to 80°, after which give air, closing with sun-heat and syringing each afternoon. A thin shade will now be required in bright weather. Do not over-water, as this Combretum is comparatively a slow-rooting plant, and until the roots have begun to enter the new soil it is better to keep it a little dry. Continue to syringe overhead when the house is shut up in the afternoon, with a moist atmosphere day and night. As growth is made keep the shoots trained regularly round the sticks, for if allowed to become entwined in each other, they are liable to get injured when being undone.

Nothing further will be required, except a continuance of this treatment until the middle of July, when, if the plants have made sufficient progress to bear a second shift, again give them pots 3 inches larger, using the peat in pieces a little larger than previously. It is safer practice with subjects of this description, which do not make rapid growth, to give two moderate shifts in the season than one large one, as, if the work is carefully done, they will not receive any check. They will now need larger and stronger sticks to support them, and through the remainder of the summer will simply want attending to as before. In September cease to syringe or shade, giving more air and less moisture in the atmosphere, as well as at the roots, so as to discourage their making much growth, and to ripen up the shoots. Reduce the temperature 5° both day and night through the autumn, ultimately lowering it to the point recommended for the preceding winter. During the winter keep them in a light situation well up to the glass, for upon the wood being well-matured will depend their flowering freely the ensuing summer. As the days lengthen, again raise the temperature gradually as before, and in April move them into pots 2 inches or 3 inches larger, according to the quantity of roots they are found to have; in these they must remain through the summer. They should now be taken off the sticks, and have stout wire trellises placed to the pots, round which the shoots should be trained so that the bottom of the trellises shall be well covered. Their treatment through the growing season will require to be similar to that which was recommended for the preceding. By midsummer they will show flower, which will open some weeks later on. It will not be advisable to remove them from the stove to cooler quarters this season, as it would check their progress, and the object will be to increase their size and ability to bloom the ensuing summer. As the autumn advances, again give more air and less moisture, treating them as before through the winter. Before growth commences the ensuing spring, if any over-long shoots exist they may be shortened back, but the knife must on no account be used too freely, or it will limit their power to flower. About the same time as previously they should be turned out of their pots, and any loose soil at the tops of the balls that the roots have not taken hold of ought to be removed. Give them a 2-inch or 3-inch shift, and treat subsequently through the season as previously. When in flower they may be moved, as already mentioned, to a somewhat lower temperature during the warmest part of the summer. Each spring they ought to be turned out of the pots, and as much of the soil removed as can be got away without much disturbing the roots, replacing it with new material; but the pots already recommended will be large enough for ordinary purposes, the plants being assisted during the growing season with manure-water once or twice a week. When grown on the roof or similar position, all that is required is to keep them regularly trained, not tying the shoots in too closely; in most cases it will be found better to confine the plant to a pot than to turn it out—not the least advantage of this plan is that so grown it can be at any time moved to another place, and it will last for years in a pot when fairly treated.

Insects. — Aphides, thrips, and red spider can easily be kept down by the use of the syringe. If affected with scale or mealy bug, dip in or syringe with insecticide.

CONOCLINIUM.

Pretty flowering plants that thrive in an intermediate temperature.

They can be raised from seeds sown in spring in moderate heat in a mixture of loam and sand; after the plants are large enough to handle move them singly into 3-inch pots filled with material similar to that in which the seed was sown. Stand them near the glass, in a temperature of 55° or 60° in the night, with air and shade by day, keeping the atmosphere moderately humid, and syringing overhead in the afternoons. By the end of June give pots a size larger, treat afterwards until autumn as in the early part of summer, and winter at about 50°. More pot-room will be required in spring, but they do not need so much root-space as many things.

The undermentioned are the most deserving of a place:—

C. atrorubens. Is sufficiently distinct to be worth growing.

C. ianthinum. A distinct kind that bears interesting flowers.

Insects.—Aphides are troublesome on these plants during the summer; for their destruction syringe freely with clean water and fumigate with tobacco.

CONVALLARIA MAJALIS.

(Lily of the Valley.)

This deservedly popular plant is one of the best for winter forcing. To have it early, say by Christmas, it is necessary to have strong well-developed crowns that have completed their growth early, such as the roots grown in Germany or other parts of Europe, where the climate permits of earlier maturity than is possible in ours. They are now imported in quantities for early forcing. This Convallaria will bear, in the matter of heat, treatment different from that of most plants, and to get it in early it is necessary to subject it to a high temperature. Unlike other plants that require to have time after potting for root-action to precede their forcing, it will submit to a high temperature as soon as potted. Select the largest and strongest crowns, and put them nine or ten together in 5 or 6 inch pots, using ordinary loam with a little sand. In potting leave the tops of the buds above the soil, which press moderately firm about the roots; then immediately plunge the pots in a bottom heat of 85°, putting some light material such as leaf-mould or cocoa nut fibre over the whole to the depth of an inch or two. In the course of a fortnight the crowns will have so far started into growth that the flower stems will be visible; then lift the pots out of the plunging material and put them in a shallow frame with a light to fit it, which frame the house the plants are in should be provided with; tilt the light an inch or two, shade the glass heavily so that little light will reach the tender blanched growth. If exposed to much light at first while in this condition failure will follow, as the flowers will not move further. As the white shoots get harder gradually remove the shading, tilt the lights more and give water as required. The plants will soon bear the full light of the house so as to be stood well up to the glass; during the time that elapses after removal from the bed in which the pots were plunged the temperature should be kept up to 70° so as to keep the growth moving freely. Under this high pressure forcing the crowns should be started about four weeks before the flowers are wanted. When clumps are used instead of selected crowns, they require larger pots, and they are better adapted for later flowering when slower forcing will suffice.

CONVOLVULUS MAURITANICUS.

Among the large number of the climbing or twining kinds of Convolvulus there are few held in much favour for cultivation in greenhouses, yet the species under notice bears effective flowers, and the habit of the plant is such as to render it suitable for a greenhouse.

It is an herbaceous perennial, and can be raised from seeds sown in pots filled with ordinary loam in a greenhouse early in spring; move them singly into pots as soon as large enough to handle, after which grow on under greenhouse treatment, training the shoots over the space they are to cover, and giving increased root-room as it is required. The flowers are blue; it blooms for a considerable time in summer. From Sicily.

Insects.—Greenfly frequently affects the young shoots; fumigation is the remedy.

COPROSMA BAUERIANA VARIEGATA.

A variegated evergreen plant from New Zealand, that, when well grown, is effective among the green-leaved inmates of the greenhouse.

It is propagated by cuttings of the soft shoots taken off in spring when about 2 or 3 inches long, put in pots filled with sand, and kept close, shaded, moist, and warm. The treatment required from the cutting stage and onwards is such as Fuchsias need, and the young plants should be kept warm so as to accelerate growth until they get to moving freely. The leading shoots should have their points pinched out two or three times during the spring and summer to cause freer growth in the side branches, which in their turn must also have their points pinched, otherwise the plants have a straggling appearance. Each spring cut the shoots in moderately before growth begins. Ordinary loam and sand with some leaf-mould is the best material to grow this plant in, with pot-room such as required for Fuchsias. There is a green-leaved form that succeeds under like treatment.

Insects.—Thrips, aphides, and red spider often attack these plants in spring and summer; to keep them down syringe daily through the growing season.

CORDYLINE INDIVISA.

This is a greenhouse ornamental-leaved plant from New Zealand, nearly allied to the Dracænas, but requiring to be differently treated, and is so much more difficult to grow that it is better to treat of its cultivation separately. When fully grown and in good condition, it is one of the handsomest of the variegated-leaved plants that are now so much cultivated. The leaves are pale green, the midrib and lateral nerves of a beautiful coral red.

It is raised from seeds which should be sown at the beginning of the year in large pans in a mixture of fine-sifted loam, peat, and sand, covering the seed slightly; keep in a temperature of about 60° in the night, just moistening the soil sufficiently to enable the seeds to vegetate. In the spring, or as soon after as the seedlings are large enough to move put them in 3-inch pots, now using good yellow loam with a moderate addition of sand, draining the pots well, as the plant is very impatient of anything approaching stagnant moisture about the roots. The best place for the young stock through the summer will be in a pit which can be kept a little closer than an ordinary greenhouse; this will slightly accelerate their growth. Shade slightly in bright weather. It may be well to mention here that this Cordyline requires to be very carefully watered in all its stages, but more particularly as it gets large with a considerable body of soil about its roots, consequently it must never be watered until the soil is approaching a condition of dryness such as the roots would not longer bear without checking growth; when water is given it must be in quantity that will fairly moisten the soil, not more. Winter in a temperature of about 50° by night, and early in spring move the plants into pots 4 or 5 inches larger, using soil as before, and keep them through the summer at a greenhouse temperature with plenty of light. They should now do without shading except so far as may be necessary to prevent the leaves getting scorched should the glass in the roof be of a description likely to thus injure them, in which case a little shade in the middle of the day may be needful. It is well always to keep this Cordyline a little warmer in the winter than most greenhouse plants, say 45° in the night, or a degree or two higher will benefit it. If they do well they should each spring require pots 2 or 3 inches larger until they get into such as are 18 or 20 inches in diameter; never in potting attempt to disturb the roots further than taking away the drainage crocks. As they get large weak manure-water in the growing season will assist them. The plant will sometimes keep in a healthy condition for eight or ten years, but, it oftener goes off at the roots before this age is reached, which keeps it scarce.

INSECTS.—This Cordyline is not usually much affected with insects, but red spider and thrips sometimes attack the leaves, getting on the undersides; these must be sought for and at once removed by sponging.

CORONILLA.

The greater number of these plants are hardy, but a few require greenhouse treatment, and are sufficiently distinct from most other things to deserve a place. They are increased by cuttings in the same way as advised for Croweas, which see.

The following are the best for pot culture:—

C. glauca. A yellow-flowered species from the South of Europe. It blooms in summer.

C. glauca variegata. A variegated form of the above; flowers and general character in other respects similar.

INSECTS.—For aphides fumigate, and syringe freely if red spider appears.

CORREA.

The varieties of these evergreen greenhouse plants mostly grown are hybrids, raised by crossing the New Holland or New South Wales species, the best originating from the scarlet-flowered C. speciosa crossed with the green-flowered C. virens. They vary in colour—from scarlet to deep crimson in the tube, with a green or lighter-coloured band near the apex of the flower. They are very free-growing plants, of compact habit, much easier to manage than many things that have been introduced from the same countries. They are free flowerers, different varieties coming in bloom from April until the close of the year, individually lasting in flower for two or three months in succession. The flowers are tube-shaped, about 2 inches long, hanging from a stalk produced from the mature growth. Why these Correas are not more grown for conservatory and general decoration seems unaccountable, as they have much to recommend them for such purposes, not the least of which is their ability to bear, whilst in flower, being placed in a more confined situation, with a less amount of light than many subjects would stand without injury. The absence of these and a number of other things that, when well grown, are both very handsome and also distinct, can only be attributed to fashion, the infectious influences of which are very often as apparent in the plants we grow, as in many other matters. This, and the too general disposition evinced to grow subjects that are difficult to manage, shuts out from general cultivation in our greenhouses many plants that might with advantage be much oftener met with.

The Correas, being comparatively strong rooters, will succeed potted in either peat or loam, but, where the former can be had in good quality it is preferable; it should not be used too fine, and ought to have added to it a fair quantity of sand, so as not alone to ensure porosity when the plants are first placed in it, but to maintain this condition for years, as with ordinary care they will last long. They should never be subjected to any reduction of the ball, or shaking out process, consequently it is necessary in the first instance to prepare the soil so as to ensure its lasting capabilities.

All the different sorts strike from shoot-cuttings, but we have not found them so certain in rooting as many things unless when taken off with a heel; to obtain cuttings in this condition a plant should have its branches all, or in part, cut back in February, immediately placing it in a little warmth to cause it to break more freely. By this means cuttings about 3 or 4 inches long may be had by the middle of May; put these in an inch or two apart in pots filled with sand, placing them in an intermediate temperature, kept moderately close, moist, and shaded; they should be rooted in two months, when give more air and reduce the shading; move singly into small pots and encourage growth by keeping them moderately warm until the end of August, in the interim pinching out the points. Keep through the winter at about 45° in the night, and towards May they should bear moving into 4-inch pots, using soil such as above indicated; during the growing season let them be a little closer with an atmosphere somewhat more moist than needful for larger stock, syringing overhead daily. Again towards autumn keep cool, and the atmosphere drier, and winter as before. Correas do not make so much root as many hardwooded plants, therefore it is not advisable to attempt giving them more than one shift during the year. It is best to re-pot them about the middle of April. If the pots are well filled with roots give them a 3-inch shift: make the new soil tolerably firm. A day previous to potting see that the ball is well moistened, but do not give any water afterwards until it is absolutely required. If the material on which the pots stand is kept damp, the length of time betwixt the operation of potting and the necessity for giving water will be prolonged. To further extend this keep the house a little close, the increased warmth produced by which will assist growth. After potting immediately train the shoots out so as to give a well-furnished bottom to the plants. They are rather inclined to an erect habit of growth, and are sufficiently strong in their wood to do without much support from sticks. This latter frequently leads to the omission of tying them out whilst young, which has the certain effect of spoiling them by their running up and leaving the bottoms scant of shoots. Stop the points to induce them to break back and form bushy specimens. All through the spring and early part of summer close the house soon in the afternoons to assist growth, and damp the plants overhead at the time of shutting up; in very bright weather a little shade in the middle of the day will help them. Do not let the soil ever become so dry before water is given as in the case of delicate hardwooded subjects. Should any shoots take the lead so as to unduly rob the weaker ones, pinch the points out and bend them down so as to give the others a chance of equalising the growth.

In August cease syringing overhead, and give air plentifully night and day to ripen up the growth. This is necessary to mature the young wood, which will cause it to flower more freely, but the ripening process need not be carried so far as with many hardwooded plants, Correas not being at all subject to suffer from mildew. They should now be wintered a little cooler than recommended for the previous winters. About the same time in the spring as before repot, again giving a 3-inch shift, and use the soil in a little more lumpy condition. They will flower nicely this season if all goes well with them, yet in the case of these plants it is better to pot at the time advised than to defer it until after they have bloomed, as it will in no way interfere with their flowering. Whilst in bloom they may be placed anywhere in the conservatory where they will not be too much crowded with other things. When the flowering is over they should at once be moved to a situation such as that in which they have been grown, and their shoots shortened back and tied out. Winter as previously, and again move into larger pots in the spring, giving them 2 or 3 inches more room, according to the greater or less quantity of roots they are found to have; treat as before through the early part of summer. This season they will make well-furnished small specimens, and will bear a good head of bloom. Attend to the tying, so as to keep them in shape; but at no time will they require more than a limited quantity of sticks to hold the principal shoots sufficiently open. After they have flowered again go over them, and shorten back the growth. It will not be advisable to repot in the ensuing spring as before, for unless very large plants are required they may be kept for years in a healthy flowering condition by the use of manure-water, given once a week or so through the growing season. They will be found to answer for ordinary decorative purposes better when thus grown to a moderate size than if larger; and as these Correas are not difficult subjects to manage, a few young ones can from time to time be started to take the place of such as get old and worn out.

C. bicolor, C. Brilliant, C. cardinalis, and C. magnifica will all be found worth a place, and repay the comparatively little care required to grow them in a much better condition than they are often seen in.

INSECTS.—Correas are little subject to the attacks of such insects as usually infest the greenhouse. Thrips sometimes make their appearance upon them, and must be destroyed by fumigation or dipping. They also sometimes get affected with scale, both white and brown, if they are placed under or in contact with other things on which the insects exist. Remove the brown species by the use of sponge and brush; for white scale repeated dipping, or syringing with strong insecticide in the winter season will be necessary.

CORYPHA.

A genus of handsome fan-leaved mostly stove Palms. They are robust gowers, ultimately requiring a good deal of room.

Propagation and cultivation given under Palms, general details of culture.

C. australis (syn.: Livistona australis). A strong-growing greenhouse species with large leaves, deeply divided, and thick in texture. In a young state it is one of the most useful kinds for decorative purposes. A native of New Holland.

C. umbraculifera. A stove species, yet it will stand much hard usage, and bear in summer a lower temperature than the stove. The leaves are plaited and divided at their outer edge. From India.

COSMELIA RUBRA.

An evergreen New Holland shrub, the only representative of the genus in cultivation; it is not equal to many things that require greenhouse protection.

It can be increased by cuttings, and grown on afterwards similarly to Epacris, which see.

Flowers red and produced in spring

COSSIGNIA BORBONICA.

This is a handsome evergreen hard-wooded shrub from the Mauritius; consequently it requires a brisk heat in which to grow it well. Its beauty principally consists in the leaves, which are pale olive-green, with a handsomely coloured midrib. This plant has been much prized by cultivators of ornamental-foliaged subjects, from the fact of its being a slower grower than the generality of fine-leaved plants, and on this account not so liable to outgrow the limits of the space allotted to it. When it has attained sufficient strength, it usually branches out freely, forming a good-sized bush, like a large Croton.

It is a somewhat difficult plant to propagate, the cuttings being harder to strike than those of many things, but they may be rooted if the young shoots are taken off with three joints or so when in a three-parts matured condition. Put them singly in small pots in sand, covered with a bell-glass, and set them in an ordinary stove until they have got callused, which will sometimes take several months to effect. They should then be placed in a bottom-heat of 75°, still kept moderately close and shaded; the sand all along must be maintained in a fairly moist condition, but not too wet. A still more certain way is when there is a strong plant to cut some or all of the branches back to where the wood is quite hard in early spring before growth commences, and then to subject it to more warmth, which will cause the back buds to break. These should be grown on gradually under the influence of plenty of light, so as to keep them from being weakly. When the shoots have reached a length of about 5 or 6 inches they should be taken off with a heel of the old wood, and put separately in small pots half filled with sandy peat, the surface all sand, kept close enough to prevent flagging, in a bottom-heat of 80° and shaded from the sun, which would injure them. So treated, a good percentage of cuttings may be induced to root, after which they must be gradually inured to bear the air of the house. When the pots are fairly filled with roots move into others 5 inches in diameter, giving them good fibrous peat and sand enough to make it porous. The plants, as soon as pretty well established, should be stood near the glass, so that they may not be disposed to get drawn up weakly. This Cossignia in its first stages is inclined to be of an erect habit, and it is useless attempting to stop it before it has got sufficient strength to enable it to support side branches, which will hardly take place before the second year. A second shift may be required during the summer, but not a large one; one or two sizes bigger pots than those into which the plants were moved from the cutting pots will be large enough. Air must be given through the growing season in the middle of the day, and shade from the sun when full on the glass will be required; syringe daily to keep down insects. A day temperature in the growing season of 75° to 85° should be given, and not lower than 60° in the winter in the night time. In the spring the leading shoot ought to be reduced two or three joints, as now the plants may be supposed to have strength enough to break and maintain a couple of shoots, which by being tied down when they have grown to the length of 10 or 12 inches will again break. Larger pots should be given as required. Managed in this way the plants keep on growing and attaining a more bushy condition for years; and if in the course of time they get at all bare of leaves about the bottom, the head and side branches may be cut well back in the spring and treated so as to cause them to break out afresh, when they usually make finer, better furnished specimens than when younger.

INSECTS.- As to insects, the daily use of the syringe will generally be sufficient to keep down the least troublesome, such as aphides, thrips, and red spider, and the smooth leathery nature of the leaves is such that they are easily freed from bugs or scale by sponging, should these latter affect them.

CRASSULA.

This name was formerly applied to a handsome and well-known plant now included in Kalosanthes. There are one or two species of Crassula, sometimes used as greenhouse climbers, though not equal for this purpose to many others. The method of propagation and after treatment advised for Kalosanthes will answer for these Crassulas.

The undermentioned are suitable for using as climbers:—

C. candida. A summer flowering kind. From the Cape of Good Hope.

C. spathulata. Flowers white, blooms in summer. Cape of Good Hope.

CRINUM AND HYMENOCALLIS.

These consist mostly of large-growing stove bulbous plants that bear very fine flowers; they are so nearly allied to Pancratiums, that, so far as their cultural requirements are concerned, they need to be treated much in the same way that will suffice for the last-named division of Amaryllids, only there is this that must not be lost sight of in the management of the several species belonging to the collective Order, that they come from widely different parts of the world; some are found indigenous to the hot low districts of India, and also the warmer parts of America and the West Indies; others, again, are met with in the cool hill regions of India and at the Cape of Good Hope. Consequent upon this, although most of them enjoy a liberal amount of heat during the growing season, still there is a considerable difference in the degree of warmth they will stand when at rest. From this it is obvious that the cultivator will have to be guided by the temperature of the country from which the respective kinds come that he happens to grow. Like most plants of a kindred nature, after their growth is completed they require a good rest, at which time they must be kept dry. All the Crinums and Hymenocallis can be raised from seeds, which should be sown as soon as ripe; when this will be, of course will depend on the time of their blooming. Supposing that ripe seeds are at hand during the later months of the year, prepare a large seed-pan, drain and fill it with sifted loam, to which add enough sand to make it moderately open; press the soil firmly down and strew the seeds over the surface about an inch apart, sprinkling a very little soil over them; stand in an ordinary stove temperature, and give as much water as will keep the material slightly moist; in the course of a couple of months the young plants will appear, after which place them near the light, continuing to maintain the soil in a healthy state as to moisture, but not too wet. In the spring increase the heat as requisite for the other occupants of the house or pit in which they are located. Their growth is not nearly so rapid as in the case of plants that come sooner to maturity; they will bear full exposure to the sun except in the brightest weather, and even then use no shading unless the leaves show signs of being injured. By midsummer prepare some more pans or pots with soil a little less sandy than was used for the seeds, and prick the seedlings out 2 inches apart, pressing the earth quite solid about them. During the summer they will bear as much warmth as most stove plants, with a fair quantity of air daily, and water as is necessary to keep the soil in a fairly moist state. Give more air with a lower temperature in the autumn; winter them in about 60°, but do not let the soil get dry, as the object is not to subject the bulbs to a dry course of treatment until they are strong enough to flower. The spring following move singly into 5 or 6 inch pots, treating generally as hitherto, syringing overhead daily to keep down insects. If they have plenty of heat they will thrive fast this the second season, and by the autumn, when the temperature is again reduced, they will have grown to a considerable size.

Winter as before, and in the spring they should be big enough for putting into 8 or 9 inch pots. Then management through the summer will require to be similar to that to which they have so far been subjected, and in the autumn some of the strongest should have the soil gradually let to get into a semi-dry state, giving only as much water as will prevent their being injured by over-drying. Again start them with warmth and moisture in the spring, keeping the strongest that have been dried in the same pots, but giving a shift to the others. Through the summer those that have been submitted to dry treatment may be expected to flower, after which move them into larger pots and encourage free growth till autumn. During the ensuing winter all that seem strong enough may be subjected to drier treatment, after which they may be expected to bloom regularly. Their natural time of flowering varies in the various kinds, and the treatment they receive causes a still further difference, so that with a sufficient number they may be had in bloom over a considerable portion of the year. All the species increase by offsets, which, when they have attained sufficient size, will bloom if left growing with the parent plant, in which case the size of pot is the only question, but mostly it will be found best when the offsets have gained considerable strength to take them off and grow them separately; this is best done in spring just before growth commences. The treatment of the divided plants will require to be in every way similar to that advised for the seedlings. Like most other bulbous plants of a kindred nature, they do not like larger pots than necessary to grow and sustain them up to full size; they want a good holding soil.

There are a large number of kinds known to cultivators, but the following will usually be found sufficient for ordinary use. Most of them bear umbels of from a dozen to thirty highly fragrant flowers.

Crinum amabile. This is a reddish purple species from the East Indies.

C. americanum. A well-known kind, with pure white flowers, very fragrant; from South America.

C. asiaticum. This is also a white-flowered species; it comes from China, and is a very desirable plant.

C. erubescens. A white-flowered sort from the West Indies.

C. giganteum. A large strong-growing kind that has very large umbels of white flowers; a native of Guinea.

C. Lindleyanum. Bears white and purple flowers; a handsome kind introduced from Maranham.

C. ornatum Herbertianum. A garden hybrid, ground colour blush, striped with bright red.

C. scabrum. White, striped with red; a native of California.

Hymenocallis caribbæa. A handsome white-flowered species that requires a strong heat to grow it well; a native of the West Indies.

H. macrostephana. A most beautiful dwarf-growing sort with white flowers, one of the finest of all the species.

H. speciosa. Also a white-flowered kind from the West Indies.

INSECTS.—These plants are not much subject to insects, although red spider will live on the foliage. But this can easily be kept down by syringing. If scale, mealy bug, or thrips attack them, sponging will be the most effectual.

CROSSANDRA INFUNDIBULIFORMIS.

A new evergreen stove Acanthad, from India, with orange flowers, tinged with red, produced in terminable spikes.

The mode of propagation and after management is similar to that recommended for Aphelandras, which see.

CROTON.

(Syn.: Codiæum.)

Few amongst the different kinds of fine-leaved stove subjects have been so extensively cultivated as Crotons, and there is no family of plants known to cultivators which gives so much variety in the way of form and colour in the foliage. All the variegated kinds (and these only are favourites with plant growers) come from hot countries, and require a high stove temperature to grow them to anything like the condition of which they admit.

These plants are very easily propagated, and quite as easily grown, provided sufficient care is bestowed upon them. Cuttings will root quickly at any time of the year, but spring is the best season for putting them in. Small pieces of the shoots should be selected, always choosing those that have their leaves well variegated. This is necessary, as if shoots that are too green are struck they almost invariably are afterwards deficient in variegation. They should be put singly in pots just large enough to hold them, half filled with sand and loam, the upper portion all sand. Kept warm, moist, with the air confined, and shaded, they will root in a few weeks; then gradually dispense with the propagating glasses; they form roots quickly, and will soon require larger pots; these should be drained and filled with good loam, liberally mixed with sand. If intended for large specimens, as soon as growth has commenced the points of the shoots should be pinched out to lay the foundation for a dense, bushy habit; to further encourage this they ought to be kept close to the roof glass, and receive air every day through the growing season when the weather is fit to admit it. They do not require any shade from the sun; unless the glass actually burns the leaves the more sun they get the finer coloured they usually are. They should be freely syringed daily, except in the dead of winter, as they are liable to red spider and a minute yellow thrip that often attacks them, and which can only be kept down by a constant application of water to the leaves. As the branches are produced they should be tied out, otherwise, if this is not attended to they get into too stiff an erect position to admit of their afterwards bending. The result of this is that they in course of time become denuded of leaves about the bottom, which makes them unsightly. These plants should always present a close mass of healthy leaves fully clothing the wood, without which they, and similar things grown for the beauty of their foliage, are deficient in the first essential to make them attractive.

Crotons will grow in almost any description of soil, and, like most other plants, make the most progress in peat, but they rarely have their leaves so finely coloured

Croton Warreni

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in it as when grown in good loam. They also like manure-water, which, when other things connected with their successful cultivation are present, causes the leaves to come yellower. The treatment from a young state up to the largest specimens, which may be 6 feet or 7 feet through by as much in height, is of a routine character, such as already detailed, giving additional pot-room as they require it. When the plants get at all straggling they may be cut back or even headed down to within 18 inches of the collar, after which they will make specimens quite equal to young plants. If wanted in a small state for decoration, Crotons look much the best confined to a single stem, as when they have side branches they are not so elegant in appearance. When required for use in this way young stock should be struck yearly. The long, narrow-leaved kinds, such as C. angustifolius—still one of the handsomest for all purposes—are most suitable.

There is an immense number of sorts now in cultivation, very many of which are so far inferior to others as to make their growth unnecessary. The following are all distinct and handsome :—

C. angustifolius. Has narrow, drooping, yellow and green leaves, 12 inches to 24 inches long when well managed, and still unsurpassed for elegant appearance. India.

C. Crown Prince. Leaves a foot long, erect, bright green ground colour, central rib and nerves yellow. A bright and regularly variegated kind.

C. Disraeli. One of the trilobed forms; it has wedge-shaped leaves that grow broader outward, dividing into two opposite equal lobes, ground colour green, the midrib yellow, which, together with the considerable portion of the leaves that come blotched with yellow, turn crimson as they get older. From the South Sea Islands.

C. Evansianus. Another distinct sort; the leaves are lobed as in C. Disraeli; the young ones pale green, heavily marked with yellow, as also the stalks; the ground colour becomes much darker as the leaves get older.

C. Hawkeri. A very distinct kind, with medium-sized leaves, more pointed than C. variegatus; three-fourths of the central portion of the leaves yellow, edged with green.

C. Johannis. A longer-leaved variety than the preceding, the yellow colour usually darker. A fine kind from the South Sea Islands.

C. majesticus. This is also a narrow drooping-leaved sort; the foliage whilst young is deep green and yellow. As it gets matured, the ground colour changes to a very dark olive, and the yellow portions become deep crimson. A very fine sort from the South Sea Islands.

C. picturatus. A most singular-habited variety from the New Hebrides; the form of the leaves is extremely variable, some having the base almost heart-shaped, with a continuation of the midrib for several inches, from which again grows another narrow portion of leaf more or less lengthened, often being in all from 15 inches to 18 inches long; the midrib is red, the rest green blotched with yellow, turning to red when matured.

C. Princess of Wales. A drooping-leaved kind, leaves about 2 feet long, ground colour pale green, heavily and evenly variegated with pale yellow. A native of the New Hebrides.

C. Queen Victoria. Leaves of medium length; when well grown they get about 12 inches long; the greater part of the leaves is of the richest golden yellow, the midrib and principal veins magenta, ultimately becoming crimson; the combined shades are very beautiful.

C. roseo-pictus. A hybrid variety of close, compact habit; leaves smaller than C. variegatus, ground colour green, midrib and nerves banded with yellow; a very bright sort.

C. undulatus. A very distinct and handsome kind, with leaves of medium length, elegantly undulated in the edges, deep green ground colour, the midrib and much of the surface yellow whilst young, turning bright crimson when fully matured. A native of the South Sea Islands.

C. volutus. A very distinct kind, the leaves all rolled back, as its name implies; ground colour green, midrib and nerves yellow, variegation constant and distinct.

C. Warrenii. Leaves 2 feet to 2½ feet long by an inch broad, drooping gracefully, deep green in colour, profusely mottled with yellow and red; one of the best. A native of the South Sea Islands.

C. Weismannii. Possesses a close, dense habit of growth; the leaves are narrow, about a foot in length, ground colour bright green, mottled and striped with bright yellow. Also a native of the South Sea Islands.

C. Williamsii. Has large, bold foliage, undulated on the edges; ground colour bright green, the greater portion of the surface yellow whilst the leaves are young, turning red with age; midrib red.

INSECTS.—The smaller species, such as thrips and red spider, already alluded to, will not give much trouble if the syringing recommended is carried out. Mealy bug and scale both affect them; these can be destroyed by dipping in or syringing with a strong solution of insecticide.

CROWEA.

These belong to a limited family of evergreen greenhouse plants, introduced from New South Wales, that are of comparatively small, bushy habit of growth, producing their lively dark pink star-shaped flowers, for two or three months in succession through the autumn, at a time when greenhouse-flowering subjects are few. Croweas have many things to recommend them to the general cultivator, not the least of which is their easy growth and adaptability for decorative purposes, especially for the conservatory, where by regulating the time that they commence growing a succession of the plants may be had so as to have some in flower from the commencement of August, to be succeeded by others that will keep on until after the close of the year. They will also bear, whilst in bloom, placing in a confined situation in conservatories or similar places much better than most hardwooded subjects; they likewise have the property of flowering freely in a very small state. Plants the first year grown from the usual nursery-sized stock will just bloom as plentifully in proportion to their size as when older. When they get large and are well-managed, they are useful for exhibition, if required for this purpose, the nature of the flowers being such that they will bear a deal of knocking about without being bruised or disfigured. They make moderately strong roots, that are not at all delicate or liable to injury from causes that would result in the death of more tender things; yet they do not form them in such large quantities as to need so much pot-room as many plants. All the kinds will grow in loam, and in it, when of a good description, the colour of the flowers is often a little higher; but in peat they generally make quicker progress, and where the latter can be had of a fair character, we should recommend it in preference to loam, using about one sixth or seventh of clean sharp sand intermixed.

Although the Croweas do not require anything above a cool greenhouse temperature to grow them, they are amongst a certain number of plants that will bear and make much more progress by having their growing season lengthened through being started in a little warmth in the winter. Their time of flowering can also be regulated by this. Plants that are thus started into growth in slight heat in February will bloom early in August if required, to be succeeded by others, the growth of which commenced with the advance of the season. Where there is the means of submitting them to a temperature of 50° in the night, with a rise of 8° or 10° by day, about February, we should advise the young stock to be so started at that time.

Croweas strike readily from cuttings which should be procured about April from plants that have started in an intermediate temperature in February; put them several together in 5 or 6 inch pots in sand, subjecting them now to an ordinary stove temperature, with shade and a moist, confined atmosphere; here they will root in six or eight weeks, when give more air and light. As soon as they are fully rooted move singly to small pots, stopping the points and continuing the warm, moderately close treatment through the summer and autumn, keeping on in the winter in a night temperature of about 50°. In March the young plants should have made enough progress to admit of their being moved into 4 or 5 inch pots, stopping each shoot; through the spring and summer give a little more warmth than usual for the generality of greenhouse plants, standing them on a moist bottom, with plenty of light and a little shade in very bright weather, giving a dash with the syringe every afternoon. Winter as before, and about the commencement of the year cut in the whole of the preceding summer's growth, leaving the shoots about 6 inches long from the point where they were shortened to the previous season; tie them out in a horizontal position, and about the time and in the temperature above advised place them where they will receive a fair amount of light, slightly damping them overhead with the syringe once a day; here they will soon commence growth and be in a condition for potting. They will require a 2-inch shift, with a fair quantity of drainage, using the soil in a moderately lumpy state, and pressing it solid in the pots. Replace the plants in a similar temperature to that they have been in, and here let them remain until the beginning of May, when there will be enough solar heat to keep them on growing without the assistance of fire; after this, they will do along with other ordinary hardwooded stock, requiring like treatment through the summer as to air, syringing overhead, and closing the house or pit they occupy with the sun upon it in the afternoon. They will not need any stopping of the shoots, except such as happen to grow considerably stronger than the rest. The reason that it is not advisable to stop these plants in the summer, as prescribed in the cultivation of most hardwooded subjects, is that if pinched back nothing is gained, as it rarely has the effect of causing shoots to break out several from each, as in the case of most things, but simply stops growth altogether for the season, and hastens their flowering. Where there is not the convenience of a house in which they can receive a little heat early, as above described, all the difference in their treatment required is to pot them later, about April, with the other hardwooded greenhouse plants, and treat through the summer as before advised, but by the latter method they cannot be expected to make so much growth, nor flower so early. When they come into bloom they will make nice little plants for standing on front shelves or in any prominent position.

When their blooming is over, remove the plants to where they will receive ordinary greenhouse treatment as to temperature, air, and water, cutting them back as in the preceding season so as to reduce the shoots to 6 or 8 inches in length from the point they were shortened to the year before, and again starting them in a little heat as previously, or if a succession of bloom is required, a portion of the stock may be allowed to commence their growth later on in the greenhouse. This year they will bear a 3-inch shift, using the soil in a little more lumpy state, and keeping the strongest shoots well tied out, so as to clothe the base of the plants, treating them through the season as heretofore. The treatment required during subsequent years will be similar in every way, always cutting the shoots well back before growth begins, or a sufficiently dense, bushy condition will not be maintained. It is not necessary to increase the size of pot beyond 15 inches in diameter, as this will be big enough for full-sized specimens. After the plants have been in pots of this size for a year or two they should be regularly supplied with manure-water through the growing season. In this way Croweas may be kept for years in a thriving, healthy state.

The following varieties are all worth growing :—

C. elliptica. A free-growing variety, and equally free in flowering ; has elliptic-shaped leaves.

C. latifolia. As its name implies, a broad-leaved kind, with large flowers of great substance.

C. saligna major. A large-flowered form of the Willow-leaved C. saligna, and much superior to the old variety.

C. stricta. An equally desirable sort, the habit of the plant more upright than the others.

INSECTS.—Croweas are not much subject to the attacks of insects ; greenfly will sometimes affect them, but can be easily killed, the nature of the plants being such as to bear without injury a strong application of tobacco smoke. The use of the syringe to promote growth during the early part of the season prevents their suffering through red spider. Brown scale is troublesome if it gets upon them, but can be destroyed by strong applications of insecticide when the plants are at rest in the winter. Should white scale get upon them there is not much chance of eradicating it thoroughly, as it requires a stronger dressing of insecticide than the leaves will bear.

CUPANIA.

Since handsome-leaved plants became so popular for cultivation under glass many stove species have been used that grow naturally to a size such as would preclude the possibility of their being accommodated in ordinary sized structures when they have attained their full stature, but by confining their roots in pots and heading them down at intervals they can be kept within bounds. Of this description are the Cupanias ; the best and most suitable for cultivation is C. filicifolia, a West Indian species that, in its native country, grows to a height of 15 or 20 feet. Its beautiful green, finely-cut Fern-like leaves are unsurpassed for their elegant plume-like appearance. The plant is one of those that should always be confined to a single stem ; if more are permitted to grow much of its elegance is wanting. It is easily grown with enough warmth at command, a desideratum which its native country at once suggests.

It may be increased at any time of the year, when cuttings composed of the young shoots 5 or 6 inches long can be taken off with a heel, such as are obtainable from a plant that has been headed back ; they will root in sandy loam in a brisk heat with a confined moist atmosphere, and shaded from the sun, so as to prevent their flagging. When well-rooted gradually inure them to the air of the house, which keep at an ordinary stove temperature. Let them be where they will have abundance of light and enough air at suitable times to keep them stout and short. This is necessary with plants like this, that are not to be stopped and grown in bush form, the object being to get them to make large leaves as near the base as possible; otherwise they will have a thin, straggling appearance, that can never be corrected until they are headed down. As this Cupania is a strong grower, it prefers good fibrous loam to peat. Move the young plants into larger pots before the roots get cramped, 6 or 7 inch will not be too large. During the spring and summer they will bear as much heat as most of the ordinary stove occupants, with a little shade in the middle of the day and air proportionate to the weather, syringing daily through the growing season; this is necessary to keep down red spider and thrips, both of which frequently attack the plant. A lower temperature in the autumn and winter will suffice, but it is not well to let the heat get below 60° in the night. Move into larger pots as more root-room is required; the size of pots which are ultimately given will depend on the size the plants are required to be grown to consequent on the size of the house they are intended to be kept in. This Cupania is very effective for an exhibition group when it gets 8 or 10 feet in height, but smaller examples will be more generally useful.

When larger than required the best way to proceed is in the spring just before growth commences, to let the soil get moderately dry, and then to head down to within 6 or 8 inches of the pots, putting them at once afterwards in a brisk heat to assist them to break. All the shoots that are made, except one to each plant, may be taken off and struck in the way described; the stools should then be turned out of the pots, any small roots that are matted at the bottom of the balls cut off, and most of the old soil shaken away, transferring them to smaller pots, but large enough to admit the roots with a little fresh soil. Treat afterwards similarly to when the plants were younger, giving them above all plenty of light, so as to keep the growth short. After heading down, the young shoots will make much larger leaves near the bottom than were produced by the first growth, and be proportionately more effective amongst large plants. Heading back may be repeated as often as requisite. Where a brisk heat is maintained, two years will generally be as long as the heads can be kept within the bounds of an ordinary stove. C. undulata is a handsome plant but inferior to C. filicifolia.

Insects.—In addition to thrips and red spider, aphides, scale, and mealy bug will live on Cupanias. The least objectionable of these pests can be kept under by syringing with tepid water; for scale and bug syringe with some insecticide and sponge carefully.

CUPHEA.

Most of these pretty free-flowering plants are evergreen shrubs, with a low bushy habit, seldom growing much above a foot high.

They are easily propagated, and as easily grown, requiring treatment similar to Libonia floribunda, which see.

A considerable number of species have been introduced, but most of them need more warmth than a greenhouse affords, and are not of sufficient merit to be worth the room they occupy when such numbers of better plants are at command.

The undermentioned will succeed under greenhouse treatment:—

C. cinnabarina. Has pale crimson flowers, and comes from Guatemala.

C. eminens. Flowers red and yellow, blooms in summer and autumn. From Mexico.

C. platycentra. A Mexican species with scarlet and white flowers; blooms continually through the summer.

CURCULIGO.

These are stove plants remarkable for their beautiful habit of growth; the long lance-shaped leaves, borne on well-proportioned stalks, are elegantly curved so as to give them a distinct and well-marked character. The leaves are like those of some Palms, while the latter are in their early stages before they are old enough to exhibit the divisions that later on are present. Few things that can be grown in such comparatively small pots are so effective for using among flowering plants, or with those that have massive foliage.

They are readily increased from suckers, which as the plants get old and large are produced in moderate numbers; these suckers should be taken off in spring before growth begins, put singly in pots large enough to hold them, and at once placed in a strong heat. Afterwards give more root-room, maintain a brisk heat through the growing season, with plenty of light, give a moderate amount of air in the day, with a moist atmosphere, and shade when the weather is sunny. They must not be let to get too cold even in the winter when at rest. They come from India.

C. recurvata. A green-leaved species much used for decorative purposes.

C. recurvata striata. The leaves of this plant are deeply plaited like the green species, but have a well-defined white band running down the centre.

C. recurvata variegata. This has noble plaited leaves, from 20 to 24 inches long, borne on stalks 15 to 18 in length, bright green in colour, irregularly banded with white.

INSECTS.—Scale, mealy bug, and thrips sometimes are troublesome, but the character of the leaves admits of their being easily got rid of by syringing and sponging.

CURCUMA.

The species of Curcuma that find favour with cultivators are few in number; they belong to a somewhat limited family of herbaceous plants, mostly indigenous to the hot districts of Eastern India; and, therefore, in order to grow them well, they require a considerable amount of heat. C. longa produces turmeric, which is much used by the natives of India on account of its medicinal properties. Curcumas are of moderate growth, their leaves attaining a height of 2 feet. The flowers, which spring from the crowns of the plants, are borne on stout foot-stalks; they are very singular in aspect, and last for weeks little impaired in appearance.

Their distinctness of form renders them acceptable additions to the occupants of the stove, especially where as much variety as possible is desired. They come into bloom during summer and autumn, when flowers are scarcer than earlier in the season. After they have bloomed they may be dried off like Gloxinias or similar things, keeping their roots in a tolerably warm place whilst at rest. They may be increased by means of offsets. These, as well as the larger roots, should be potted and started into growth in the spring. The small offsets ought to be kept by themselves and grown on to acquire more strength. An 8-inch pot will be large enough for four of the smaller roots, and a 10-inch or 12-inch pot for a similar number of the larger size. They will succeed in either peat or loam, or in a mixture of both; but where peat can be had of good quality, containing plenty of fibre, it is to be preferred; that which is of a compact, soapy nature is not fit for Curcumas, even if incorporated with leaf-mould, rotten manure, or loam. Consequently where nothing better than such can be obtained, it is advisable to grow them in loam, in all cases using plenty of sand to keep the soil in a thoroughly porous condition; for if the water cannot pass freely through it, the feeding fibres of the roots will make little progress, and in that case the growth above ground will not be satisfactory. One-sixth rotten manure added to the peat or loam—whichever is used—will tend to greatly increase the strength of the plants. The pots should be well drained with 2 inches of crocks, over which a little porous material ought to be laid to keep the soil from getting down and clogging the drainage. Press the compost in the pots, filling them up to about two-thirds their depth; then put in the roots, and cover over with soil to within an inch of the rim. Place them in a temperature of 65° at night, allowing 10° higher in the daytime, and do not give too much water to the soil until the young shoots have appeared above the surface, when it may be kept more moist. When fresh started they may be set on a tan bed in the centre of the house; but as soon as the young growths appear, they should be moved to where they will receive sufficient light to prevent the leaves becoming drawn. This is of more importance in the case of these plants than in that of most others, as their flowers do not rise above the foliage in the ordinary way.

A thin screen will be required when the weather is bright, but do not subject them to permanent shade. As the days lengthen and sun-heat increases, raise the temperature to 70° at night, and correspondingly higher in the daytime. Give a moderate amount of air, but do not let them be in a draught by placing them too near where air is admitted. With these, as with almost all plants that require heat, growth will be accelerated by closing the house whilst the sun is yet upon the glass, as the influence of solar heat in promoting growth, especially in the afternoons when the atmosphere is well charged with moisture, is much more conducive to strength and healthy development than is fire-heat. When the house is shut syringe overhead freely, and continue this treatment until they show flower, when the syringe will be of no further use, but the atmosphere must not be kept too dry. The flowers have a tubular 3-toothed calyx; the tube of the corolla is dilated above, five of its lobes being equal, but the lip is large and spreading. As the flowers open the plants may be inured to more air, and when expanded they may be removed to the conservatory if it is kept at an intermediate temperature; but if not warmer than an ordinary greenhouse, they must not be allowed to remain in it after the weather has become cold. After that they should be returned to the stove and supplied with warmth, and water at the roots until the leaves show signs of decay, when the amount of water may be gradually reduced in quantity till the tops are dead, when they should be kept dry. They should not, however, be subjected to a low temperature, or they will be liable to rot. Keep them through their season of rest about 60°, and early in spring turn them out of the pots, removing the old soil completely, and repotting in new material as recommended for the preceding season.

The following are well worth cultivation:—

C. Amada. A variety which comes from Bengal, a fine kind, whose red and yellow flowers are produced during the summer.

C. aromatica. Has yellow flowers, which are produced in the summer; it comes from the East Indies.

C. cordata. Another East Indian orange and rose coloured sort, which blooms in July and August.

C. Roscoeana. An East Indian kind, with orange bracts and red flowers, which are produced in July and following months.

C. rubricaulis. From the East Indies, generally blooms somewhat earlier than the sorts just named; its flowers are reddish yellow in colour.

INSECTS.—The continued use of the syringe through the growing season keeps in check red spider and thrips. Scale and mealy bug will live upon them, but they can be easily removed by sponging, and the yearly decay of the leaves effectually destroys any perfect insects or their eggs that may have got on the plants during the summer.

CYANOPHYLLUM MAGNIFICUM.

This is the best of all the Cyanophyllums—so much so, indeed, as to make the others not worth growing. We shall, therefore, confine the details of cultivation to this species, which is rightly named, for amongst all the fine-leaved stove plants that have been introduced, if we except some of the best of the Palms and their allies, there are none yet that equal the majestic foliage which this plant when well grown produces. A vigorous specimen will make leaves a yard long, by over 20 inches broad, their almost black-green silky upper, and reddish-purple under surface, affording a striking contrast to all other cultivated forms of vegetation. It is a Melastomad capable of bearing as high a temperature as the hottest stove plants require. A single stem is all the form of growth worth encouraging, although when strong it breaks freely.

These side shoots or the extreme top make cuttings that will root in a few weeks, placed singly in 3-inch or 4-inch pots, half filled with peaty soil, the upper surface all sand, kept moist, confined, and shaded when requisite, in a temperature of 75° or 80°. Under such conditions they may be struck at any time of the year when cuttings are at hand, but, supposing them to be rooted in April, they should at once be stood where they will receive enough light, otherwise the leaves formed will be thin, and not able to last long. To grow this Cyanophyllum large it must have plenty of root-room; the first move from the cutting state should be into pots 7 inches or 8 inches in diameter, using good peat, in which the growth is quicker than in loam. Although the plant cannot be grown too near the glass, still its leaves are thin in texture, and if not shaded when the sun comes directly upon them with any considerable force they are liable to get injured; but the shading should only be used when the sun is likely to do harm. Give air when the weather is mild, if only for a short time each day; plenty of water must also be given. As soon as the roots have got well hold of the soil, move into pots 15 inches in diameter, using peat in a lumpy state, with a good sprinkling of sand and some rotten manure, for it is a gross feeder, and when the soil is full of roots it will take manure-water freely, which will much assist the leaves both in size and in the lustrous shade they get when the plant is well managed. It can be grown to a handsome size in a single season, and very large with a second year's growth. In autumn cease shading and give more air, reducing the temperature gradually, so that in winter it is about 65°, at which time keep the roots a little drier, but never withhold water to let them get as dry as many things require, or the leaves will suffer. Treat during the ensuing summer as before; in the autumn the extreme top may be removed and struck, which will have the effect of causing some of the lower eyes to break. When the shoots thus made are large enough, they can be taken off with a heel and struck. If required, the old stem may be headed down to the bottom, the ball half shaken out, and the stool repotted in new soil as soon as it has made a little growth; after heading down in this way larger leaves will be formed than those produced by the first growth. After the second season young plants will be preferable in some cases.

INSECTS.—The daily syringing which this Cyanophyllum should have during the growing season will suffice to keep down the smaller insects, but care must be taken that the water gets well to the under surface of the leaves, or thrips will effect a lodgment. Syringing will also keep down mealy bug, which is very fond of establish-ing itself in the inequalities at the under side of the leaves.

CYATHEA.

A fine genus of Tree Ferns, the most important of which are greenhouse species. Several of them are unsurpassed for their majestic appearance. Among the finest is C. dealbata, which forms a beautiful, straight, well-proportioned trunk, surmounted by a grand head of plume-like fronds of enduring character. C. medullaris is one of the largest and handsomest species, requiring a large house for the exhibition of its true character. Cool treatment, with much less root-room than usually given these and other Tree Ferns, is preferable to the humid stove heat and over-potting often practised.

For propagation and cultivation, see Ferns, general details of culture.

GREENHOUSE SPECIES.

C. Burkei. South Africa.
C. Cunninghamii. New Zealand.
C. dealbata. New Zealand.
C. Dregei. South Africa.
C. medullaris. New Zealand.
C. princeps. Mexico.
C. Smithii. New Zealand.

CYCAS.

These are noble-looking plants, the leaves of which much resemble Tree Ferns in form, but are hard and tough in texture, enduring long on the plants. They are amongst the finest ornaments of the stove or conservatory. Their flowering in this country is not a very common occurrence, and when they do bloom the flowers are nothing more than a curiosity.

They seldom produce suckers so as to give an opportunity of increasing them by this means. The plants are nearly always imported. Their cultivation is very simple; they succeed in good ordinary loam made sufficiently porous by the addition of sand. The pots must be well drained, as the roots will not bear stagnant moisture. Most of the species do not require so much root-room as the generality of plants equal in size, and it is a mistake to overdo them in this respect. An ordinary stove or intermediate temperature will answer for them summer and winter—there is no necessity for being particular to a few degrees; 55° to 60° in the night during winter, with a proportionate rise by day, and 60° to 70° in the night in summer will answer. Most of the kinds, however, will bear as much heat as any of the stove occupants in the day through the growing season, but there is no need for subjecting them to so much; it is simply a question of their growing quickly or slowly. They may be kept for years in moderate-sized pots or tubs if a moderate shift is given them when they are moved. During the growing season they should have plenty of light and room to fully extend their leaves; they also like a drier atmosphere than most plants.

The following are fine kinds:—

C. Armstrongii. A handsome, bold-leaved sort.

C. circinalis. A very large leaved, handsome kind, requiring a good deal of room. A native of India.

C. circinalis glauca. A glaucous-leaved form of the above.

C. media. A handsome kind, of moderate size. New Holland.

C. plumosa. Has beautiful plume-like foliage; a handsome species from India.

C. revoluta. A Chinese species that will thrive in a warm greenhouse.

C. Riuminiana. A fine kind from the Philippine Islands.

INSECTS.—The hard nature of the leaves is such as not to afford much food for insects, but scale will sometimes become troublesome, and sponging is the best remedy.

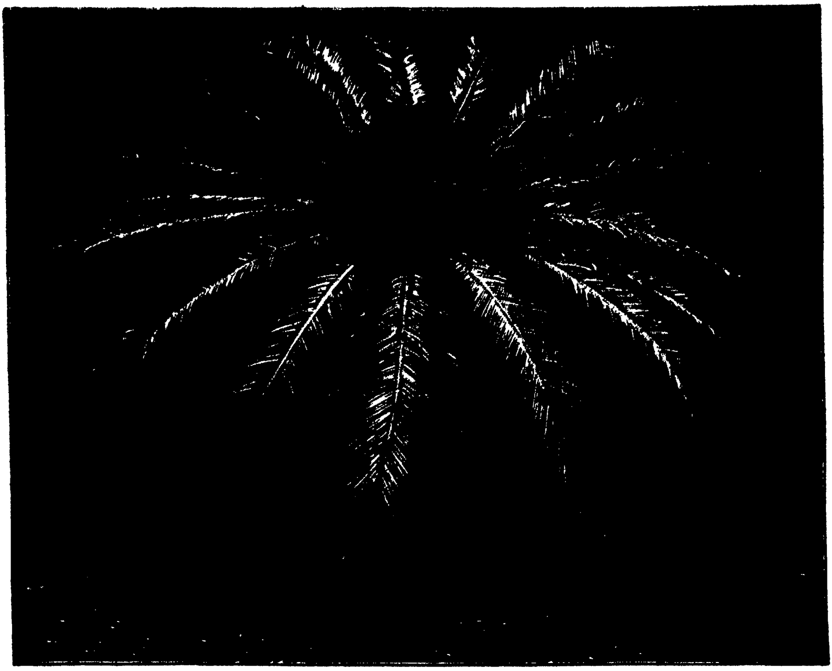
CYCLAMEN.

The Cyclamens now so largely used for pot cultivation are almost wholly confined to the race of seedling varieties of C. persicum that in recent years have been so much improved both in the size and colour of their flowers, as also in the disposition to produce them in much greater quantities than the original species could be induced to. So great is the improvement that the Cyclamens of the present day are amongst the most beautiful and continuous bloomers of all greenhouse plants.

The cultural treatment, with more warmth stimulating quick growth, that this new race is found to best succeed with, is very different from the old slow method of growing them, by which the plants were yearly, after blooming, subjected to a severe drying process whereby they were much enfeebled. The ordinary, and much the best way of propagation is from seed, which may be sown at different times of the year, according to the season they are required to flower. If well managed the plants will be large enough to admit of flowering when from fifteen to eighteen months old. To bloom in spring sow about November or December; if wanted to come into flower during the late autumn and winter months sow about the end of July, in wide shallow pans filled with a mixture of sifted fibrous loam, with some leaf-mould and a little sand added. Press the material moderately firm, scatter the seeds an inch apart over the surface, and cover them with about a fourth of an inch of the soil. When sown at this time stand in a temperature of about 60°, where they will soon vegetate by keeping the soil a little moist; to do this without giving too much water a thin paper may be laid over the surface and removed as soon as the plants are up, after which they must be kept close to the glass, and the sun not allowed to reach them. The best place in which to grow them through their early stages is a low heated pit where an intermediate temperature (which is necessary all through the first autumn and winter so as to get them on large enough to flower satisfactorily by the close of the ensuing year and on through the subsequent winter) can be kept up. Give a moderate amount of air daily from the time the young plants are up, keeping the atmosphere a little moist, and syringing slightly in the afternoons; as soon as large enough to handle move singly into small pots, using soil similar to that in which the seeds were sown. Stand them on a moist bottom, still close to the glass; leave off shading as the sun decreases in power, and keep up a night temperature during the winter of about 50°, in which they will go on growing so as to require moving at the beginning of April into 3-in. pots. Then use similar soil, but add a little cow manure that has got old and mellow. They will now require a little more warmth, and until the season is further advanced enough fire should be used in cool weather to keep them up to 55° in the night, and proportionately higher by day when there is an absence of sun to raise the temperature. A thin shade will again be needful through the spring and summer whenever the sun comes on them. Care must be taken at all times through the season of growth that they never want for water at the roots, or they will receive a severe check. Keep the atmosphere and the material on which the pots stand moist, syringe overhead each afternoon, all of which are requisite to keep them free from red spider. Give air every day, but avoid draughts; towards the end of June move the plants into 6-inch pots, which will be large enough to flower them in the first season, and use a fair amount of drainage. Continue to treat as hitherto advised in the early part of the summer until September, when give more air, and discontinue shading and syringing so as to solidify the growth and induce the formation of flowers. Still let them have a position near the glass, but through the autumn and winter let the material on which the pots are be dry. If each plant is now stood on an inverted pot it will allow a better circulation of air round them; with the same view do not crowd them too close—a condition that should in all the stages of growth be avoided or the leaves will get drawn and weak and the plants spoilt. If all has gone well they will now be sturdy examples, with short stout leaf stalks, the foliage half covering the pots; they will flower freely through the last months of the year and early part of winter, during which they should be kept in a night temperature of 45° or 50°.

After blooming keep a little cooler, and when all danger of frost is over they may be turned out under a north wall, the pots plunged in ashes, or still better they may be kept in a cold frame, placed where they will be out of the full sun, and given enough water to prevent the soil getting quite dry. The plants will lose most of their leaves through the early part of summer, but will afterwards push up quantities; as soon as these are visible give more water, and when a little growth has been made move into pots a couple of inches larger, shaking away the old soil and replacing it with new, of a like description to that hitherto recommended. Afterwards stand them in a pit, frame, or house and treat as advised for the preceding season, except that they will not now require to be kept quite so close. The ensuing winter the plants will yield numbers of flowers proportionate to the increased size they have attained. After blooming again treat as in the previous spring and summer in the matter of standing out, repotting, &c. They may be kept on after they have again flowered, or be discarded and their place taken by younger stock, which it is well to keep coming on by sowing some seed each season. When the sowing is deferred until autumn keep a little cooler both before and after the plants come up, and it will be well to prick them off, when large enough, 2 inches apart in pans, allowing them to remain until spring before potting singly; afterwards treat as advised for the early sown stock.

Insects.—Red spider, to which they are liable, will usually be kept under by following the course of cultivation detailed. Thrips and aphides sometimes attack them, getting to the undersides of the leaves and doing much mischief before being seen. These insects should be ge-



Cycas Revoluta in Fruit.

Cyclamen Persicum.

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peatedly sought for ; when discovered dip in tobacco-water or fumigate with tobacco.

CYCLANTHUS.

This is a small genus nearly allied to, or more correctly speaking a division of the natural Order, Pandanaceæ. They are stove plants little cultivated, but those who are fond of fine-foliaged subjects may like them.

The method of propagation is by suckers which require to be struck and grown on in the way advised for Pandanus, which see.

The following are, we believe, all the species known in cultivation :—

C. bipartitus. A handsome species with large leaves. From Trinidad.

C. cristatus. A strong-growing kind, with longer and more massive leaves than the preceding. It comes from the West Indies.

C. plicatus. This species is quite different in appearance from C. cristatus, being less vigorous in growth.

C. Plumieri. This is a distinct-looking sort, with well marked foliage. From Trinidad.

CYPERUS.

Grass-like stove plants much used for decorative purposes in a cut state for intermixing with flowers. They are also well adapted for use associated with blooming plants.

They are easily grown and increased by division of the crowns ; spring just before the growing season comes on is the best time to increase them. Plants composed of several crowns should then be turned out of the pots, and divided into small pieces, which should be put singly in pots big enough to hold them. Ordinary loam with a little sand will grow them well ; when potted water freely. The plants are almost aquatic, growing as well in water as in the usual way. Stand in a temperature of from 55° to 65°, a few degrees either way will not make material difference ; give shade and air such as required by ordinary stove plants. By the middle of June move into 6-inch pots, the size which will be most useful for general purposes. Treat as before through the summer, by the end of which the plants will be large enough for use ; keep the soil a little drier during the winter, through which a night temperature of 50° or 55° will be enough.

The following are desirable kinds :—

C. alternifolius. Bright green leaves. A native of Madagascar.

C. alternifolius variegatus. A variegated form of the last-named.

C. laxus. A distinct and pretty green species.

C. laxus variegatus. A variegated form of C. laxus, of recent introduction.

INSECTS.—These Cyperus are little subject to insects, on account of the quantity of water they require, but aphides are sometimes troublesome ; for these fumigate.

CYRTOCERAS REFLEXUM.

This is a handsome free-flowering stove plant of moderate growth, very nearly allied to the Hoyas. In some respects, indeed, it closely resembles them, especially in the general appearance of the flowers and in the short spurs on which they are borne. The shoots are of a stout woody character, erect, and comparatively few in number, springing from the collar of the plant, and not much inclined to branch ; the leaves are thick and leathery and of a bright green colour. This plant is well adapted for cultivation by those who have not the convenience of a large stove, as it is a slow grower, and takes a considerable time before it occupies much space ; moreover, it bears cutting in freely when required, breaking up from the bottom if the heading down is performed in the spring. It is indigenous to Manilla, and consequently needs to be kept always warm, but when in flower during the summer it can, without injury, be moved to a conservatory ; it must not however be allowed to remain in a draught. Although it does not suffer from the drier atmosphere usually here maintained, like many stove subjects, this can be accounted for by the plant never requiring an atmosphere laden with moisture to such an extent as many occupants of the stove need ; in fact, if the air in which it is grown is too close and damp, it often has the effect of causing the flowers to fall off before they open. Neither does it thrive in so much shade as quicker-growing thinner-leaved plants demand ; it will be sufficient to slightly protect it from the direct rays of the sun, during the hottest weather, so as to prevent the leaves being scorched.

It strikes freely in the spring from half-ripened cuttings, especially if these consist of side shoots that can be taken off with a heel. They should be inserted singly in small pots in a mixture of half sand and fine loam, placed in a brisk heat and covered with a bell-glass ; they will root in four or five weeks, after which inure them to more air, and let them have plenty of light, but not much sun, until they have become more fully established, when they should be removed to 5 or 6 inch pots. It will succeed in either peat or loam, but we prefer the latter when it can be had of good quality with plenty of turfy fibre in it. Whilst the plants are small, it should be broken fine; add about one-sixth of sand, according to the nature of the loam, and drain the pots well, as the plant cannot endure stagnant water. This Cyrtoceras does not make a large quantity of roots; consequently it must never be overpotted, and care should be taken not to give too much water, especially until the soil has got well filled with roots. As soon as they have started fairly into growth, the points of the shoots ought to be taken out to cause them to break, as it has a natural tendency, if not checked, to extend without branching sufficiently. During the summer the night temperature should be kept about 70°, and air with a thin shade given in the daytime when the heat rises to 80°; syringing overhead in the afternoons will assist growth. Continue the above treatment until the weather begins to get cooler; then discontinue the use of the syringe, as also shading, giving more air and less water to the soil. Through the winter a night temperature of 60° will be sufficient, keeping the plants in the lightest and driest part of the stove. About the beginning of February give them 5° more heat in the night, with a corresponding increase in the day, but do not repot until the roots have got well into motion; and as one shift in the season will be quite sufficient, it is well not to move them till April, when they should be put into pots 3 inches larger, now using the soil in a little more lumpy state.

Tie the branches well out, bending them down close to the rim of the pot—this will have the effect of causing young shoots to push up from the collar; at the same time pinch out the points of those existing. As the weather gets warmer increase the night temperature to 70° and proportionately more in the day, with a little shade, damping overhead when the house is closed. All that will be requisite during the summer will be a continuance of the treatment recommended. Most likely a few flowers will be produced by the strongest shoots, but it will not be advisable to move them out of the stove, as the object will be to get them to make as much growth as possible. In the course of the summer the tops of the strongest shoots may be tied down; this will still further induce them to break back, and at this stage of their growth will be found more effectual than stopping, which latter operation does not always cause this plant to branch out several shoots as in the case of the majority of things. Treat through the autumn and winter as before. Again in spring give more heat as the advancing season demands it, and move into pots 3 inches larger, tying the branches well out so as to leave the plants quite open in the centre to still further induce the formation of young growth from the base. This Cyrtoceras is one among a number of subjects that require especial treatment in this respect, for if left to its own course it would spire up to a considerable height and become naked at the bottom; whereas if the strong shoots are kept well tied out, the position to which they are thus bent causes them annually to produce fresh growth from the bottom, which takes the place of any branches that become denuded of leaves at the base and which should be removed. If the progress made is satisfactory, the plants will this summer bloom freely, each shoot producing a number of their epaulette-like bunches of flowers. After the flowers are formed it is better not to syringe overhead, as this sometimes has the effect of causing them to drop off.

The subsequent treatment of the plants will require to be similar to that so far advised. When grown to their full size, 13 or 14 inch pots are, as a rule, large enough for them. After they are fully developed they should be turned out of the pots each spring, the drainage examined, and such of the upper portion of the soil as is not occupied by roots should be removed and replaced with new. When they have arrived at a size such as we now suppose them to be, they will be much benefited, during the summer, by liquid manure once a week, but in using it for this and similar spare-rooted plants it must never be given either so strong or in such quantities as for naturally robust growers; it is even necessary to be careful never to apply water at all until the soil is somewhat drier than in the case of most stove plants, or destruction of the roots will, sooner or later, be the result, especially during the winter, when no growth is progressing. We may add that when this plant is thus injured at the roots it has not the power to recuperate itself, like many others.

INSECTS.—The leaves of this Cyrtoceras are of too tough and leathery a nature to be much hurt by the attacks of such insects as thrips, aphides, or red spider, except when these are allowed to get to a considerable head; yet the insects will live upon them, especially if the

CYPERUS ALTERNIFOLIUS. *To face page* 138.

atmosphere in which the plants are grown is kept too dry. If affected, they should be laid on their sides and freely syringed, when the insects can be easily removed, the smooth surface of the foliage, both on the upper and under sides, nct affording much harbour for them; the stout substance of the leaves also admits of the water being thus applied without injury. Where scale has made a home upon a plant it will be found necessary to resort to sponging and cleaning thoroughly with soapy water; a good syringing should be afterwards given it to cleanse it from all impurities.

CYTISUS.

The kinds here treated of are free-flowering evergreen greenhouse plants. They are in no way particular as to soil, growing in either peat or loam, but the latter is preferable, as it causes a greater disposition to flower.

The different sorts of Cytisus root freely; cuttings put several together in 5 or 6 inch pots in March, filled with sand, and kept moist and close in moderate warmth, will be sufficiently rooted in five or six weeks to move singly to small pots. Pinch out the tops at the same time, and encourage growth by keeping them a little close and moist through the spring and summer, shading a little in bright weather. By the end of June move to 4 or 5 inch pots, and pinch the points of the shoots when they have made 3 inches of growth, closing the pit or house in which they are grown early in the afternoon, and moistening overhead at the same time. Continue this treatment until the end of August, when inure them to more air and cease syringing, keeping them through the winter at an ordinary greenhouse temperature. About the end of March or beginning of April give them a 3-inch shift, potting them in good fibrous loam, to which has been added one-sixth well-rotted dung, the latter passed through a fine sieve, so that all worms may be detected. Give a moderate sprinkling of sand and sufficient drainage; pot firm, and pinch out the points of the strongest shoots. They require no support, but, like Acacias and some other strong-wooded things, unless the branches are tied down whilst young they have a disposition to grow erect, and leave the bottom leggy and bare—consequently the necessary training should be attended to in the first stages of cultivation. Through the spring syringe them overhead every afternoon, getting thoroughly to the under side of the leaves, as well as to the upper surface, and turning the plants round occasionally, so that the whole may be reached by the water. This is necessary to keep down red spider, to which they are subject. By shutting up the house early while the sun is on the glass growth will be encouraged, and as soon as the roots get well hold of the soil they must be liberally supplied with water, as when in free growth they require a good deal. Continue this treatment until the beginning of August, when the plants should be turned out-of-doors and stood on a bed of ashes, in a situation where they will be protected from the mid-day sun; they will now require well attending to with water at the roots, which will have filled the pots by this time. Continue also to syringe overhead every evening during dry weather. By the middle of September it will be advisable to take them indoors; they will do in any house or pit where there is a fair amount of light, and from which frost can be excluded. By placing a portion of them in a temperature of 50°, about the close of the year, they can be had in flower early, and others will succeed them started later, to be followed by those that bloom with the advent of solar heat. After they have flowered, go over the whole with the knife and cut back the leading shoots so as to keep the plants in shape; and when they have broken and the roots begin to move again, pot them, giving a 3-inch shift, using soil similar to the preceding year, and treating in every way as before advised. They may be grown on to a large size if required, but will bear cutting back, the balls considerably reducing, and repotting in new soil, but after this operation they should be kept close and a little warmer until growth has fairly commenced.

C. filipes is a white-flowered species, of very slender, graceful, drooping habit, and is much used grafted on straight, clean stems of the Laburnum, 2 or 3 feet high, so as to form pendulous standards. So managed it is one of the most elegant plants grown, especially for conservatory decoration, where, standing above lower-growing things, it is very effective. The stocks will succeed either from seeds or cuttings. After grafting the plants will thrive satisfactorily with general management such as advised.

C. racemosus superbus. This is a garden hybrid, a considerable improvement on the old C. racemosus, and one of the most useful decorative plants grown, producing most freely its racemes of sweet-scented, bright yellow flowers through a good portion of the spring.

INSECTS.—As already intimated, red spider is partial to these Cytisuses, but where the precaution of diligent syringing is continued through the growing season this pest can be easily kept in check. If by any chance it happens to get a footing on them it can be destroyed by dipping, or thoroughly syringing overhead with insecticide. If affected with brown scale, dip or wash with strong insecticide when the plants have been cut back before growth commences.

DÆMONOROPS.

A genus of quick-growing stove Palms, with somewhat slender stems, and large, handsome leaves.

Propagation and cultivation given under Palms, general details of culture.

D. fissus. A distinct and handsome species. From India.

D. palembanicus. A stately species, with large arched pinnate leaves; the pinnæ long and about 3 inches broad; the leaf-stalks are stout, proportionate in length, and furnished with large and formidable spines. It comes from Java.

DALECHAMPIA ROEZLIANA ROSEA.

This plant is more singular than handsome; the flowers, or rather the bracts, which are most conspicuous, are deep pink in colour, produced in summer, but are not so effective as to give it a high position among flowering stove species.

It is easily propagated from cuttings of the soft shoots, which if put in sand during spring, kept moist, close, and shaded in a temperature of 70°, will root in a few weeks, when they should be moved singly to 4-inch pots. Ordinary loam with a little leaf-mould and sand will grow the plant well; stop the points of the shoots, and keep in an ordinary stove temperature, with shade and air in the day, and a moist atmosphere. It is a rapid grower, and will bear moving into 8 or 9 inch pots by the middle of June, when again stop the shoots. Continue to treat as before until autumn, and winter in a night temperature of 65°. Give pots a couple of sizes larger in spring, raising the temperature, and treating generally as in the summer before. The plants will bloom for a considerable period during the season; they will flower in a small state if little plants are thought desirable. From Vera Cruz.

INSECTS.—Red spider and aphides are sometimes troublesome, especially the former, if syringing is not attended to daily in the growing season; for aphides fumigate.

DAMMARA.

Most of the cultivated species of these plants attain the proportions of trees; but, like the Araucarias, can be kept for a time so that they can be accommodated in a good-sized conservatory, where from their distinct appearance they are effective.

They thrive under conditions such as advised for Araucarias, which see.

D. alba. Origin uncertain.

D. Brownii. Origin uncertain.

D. Moorei. A native of New Caledonia.

D. obtusa. Comes from Aniteura.

DAPHNE INDICA.

This highly fragrant evergreen greenhouse plant, of which two varieties occur, is a native of China. It is a somewhat slow grower, compact in habit, and does not attain a large size, but it has a remarkably free disposition to bloom. There are few flowers, excepting the Rose, more prized for their fragrance than these Daphnes. A small plant when in bloom will scent a whole house. For this purpose they are highly esteemed for placing in conservatories, especially when these are connected with dwellings where the presence of fragrant flowers is a desideratum. The large number of Daphnes annually propagated in some nurseries, coupled with their being such general favourites, would lead to the supposition that they would be more frequently met with than they are. That they are not so much grown is accounted for by the fact that, although easy enough to grow when they receive the treatment they require, they are almost certain to die or linger out a dwindling existence if managed on the unintelligent system of treating all things alike that will conform to any particular temperature, more especially in the two very important operations of potting and watering.

It is to the fact of these plants being too often treated after this general sort of fashion that their not thriving with many growers is to be attributed. Either when grafted or on their own roots they are very spare rooters, and cannot bear over-potting. If as much root-room is given them as required by many things it is all but impossible to keep them in health. They are also very impatient of too much water, and never, even when making active growth, must water be given before it is required by the soil, which, in their case, should be allowed to get drier than with most plants, yet not so as to allow the young growth to flag. But it is in the dormant season, after the growth is completed, that it is necessary to exercise more than ordinary care that water is not applied too soon. We prefer plants struck from cuttings, but these are seldom to be met with, as the demand is such that grafting is generally resorted to, on account of their being so much more rapidly increased by this method.

In private gardens we should advise the plants being propagated from cuttings, which should be composed of the points of the shoots, about 3 inches long, taken off towards August and put in pans 3 inches apart in sand, covered close with a propagating glass, shaded, and kept moist in a cool house or pit until the base of the cuttings is callused over. When this has been effected put them into a temperature of 50° by night, where they will make roots, still keeping them moderately close until well rooted, after which dispense with the glasses. They should be in a condition for moving singly into 3-in. pots by the end of March; give an intermediate temperature through the spring, pinching out the points as soon as the little plants have got their roots freely in motion and are making top-growth. Towards July give pots an inch or two larger, and keep in the same genial warmth through the summer and autumn. Although, strictly speaking, greenhouse plants they make much greater progress, especially while young, if kept in a temperature of 50° by night, and proportionately warmer in the day, if a house or pit is available, where they can be accommodated through the winter with a temperature such as above-mentioned, they should by the beginning of April be moved to pots 2 inches larger; but, as has been already stated, they must not have too large a shift at any time. They succeed the best in good fibrous peat four parts to one of thoroughly rotten dung, with a liberal addition of sand. Drain the pots well, and over the crocks place some fibrous material to keep them quite free from the soil, as if the crocks become clogged up ever so little the roots will suffer. Stand them in a moderately light position, and syringe slightly overhead in the afternoon, but be sparing of water to the soil until the roots have made some progress.

When the shoots have pushed about 2 inches pinch out the points to induce them to break, and continue them in an intermediate temperature all through the spring and summer, tying out the growths to a few neat sticks, so as to lay the foundation for bushy specimens. Give air moderately during the day, but close the house with sun-heat and plenty of moisture in the atmosphere; in bright sunny weather they will be benefited by a thin shade during the middle of the day, but this must not be used so as to induce weak growth. By the end of August, if all has gone well, the plants will have pushed their shoots 3 or 4 inches beyond the point to which they were stopped, and if the intention is to grow them on to a considerable size as quickly as possible—which is much the best method of treating these Daphnes—they should be kept on through the winter and during the ensuing summer in an intermediate-house temperature. Where it is decided thus to deal with them they ought at the end of August to be moved into pots an inch or two larger, according to the quantity of roots they are found to possess when examined; pot in similar soil to that recommended for them in the spring, and again pinch out the points of the shoots. Syringing overhead may now be dispensed with for some time, but maintain through the autumn a temperature of as near 50° in the night as convenient, and be careful how water is given to them; if very vigorous they will shortly break into growth. pushing three or four shoots from each point that was stopped—if not so strong they may not push growth for some months, but nevertheless much will be gained by keeping them a little warm, as the root-power will be increased.

Treat through the early part of the ensuing season as advised for the preceding year, and towards May again turn them out of the pots to see if they require another shift, which will be the case if they have done well. If the roots are plentiful give them pots 2 inches larger, stop and tie out the shoots, letting the summer's management be similar to the last. By the close of the summer they will have grown into nice-sized plants, with a quantity of strong flowering growths that will have set their bloom bunches on all the points; they may now be placed among the ordinary greenhouse hardwooded stock through the autumn, and if required to flower early a portion of them may be put in a little heat about the beginning of the year. If their flowers are wanted for cutting, choose those from the strongest shoots, such as have a strong terminal bud at the base of each of the leaves with which the shoots are furnished for some distance from the points. The blooms being produced in compact bunches, with no length of foot-stalk, it is necessary in cutting them to take some little of the wood with several of the leaves attached.

Growths that are weakly are generally devoid of the buds above-mentioned, and if the flowers from them are cut with the buds that are immediately at the base of the flowers they rarely break freely, more often not at all; but when strong buds such as pointed out exist, these will push growth when the points of the shoots with the blooms have been removed. It is thus necessary to use discrimination in cutting the flowers of these Daphnes, or it will induce the bare, naked condition so often seen. When it happens that a plant is altogether weak it should not be cut at all. The treatment in after years should be similar to that which has been so far advised, with the exception that it is not requisite to grow them in anything above a greenhouse temperature. A 12 or 14 inch pot is big enough for them when they arrive at a large size. When the pots get full of roots the plants should be well supplied with manure-water during the growing season. Where there is not the convenience for giving them in their early stages a little extra warmth, as above advised, they should not be potted before the end of April; and during the summer ought to be kept as warm as circumstances will permit, by closing the house early, treating them in other respects as advised under the quicker method of growth.

The two varieties, *D. indica alba* and *D. indica rubra*, differ but little in general appearance. The flowers of the latter are higher coloured than those of the former.

D. japonica variegata is also well worth growing, both for its flowers and handsome variegated foliage. It succeeds under similar treatment to the others.

INSECTS.—These Daphnes are not much troubled by insects, but sometimes the young shoots are attacked by green-fly, for which fumigate with tobacco; thrips also will prey upon the leaves, and the best remedy is to dip or syringe with tobacco-water. If brown scale gets upon them it must be removed with a sponge, as any solution strong enough to kill it is liable to injure the leaves.

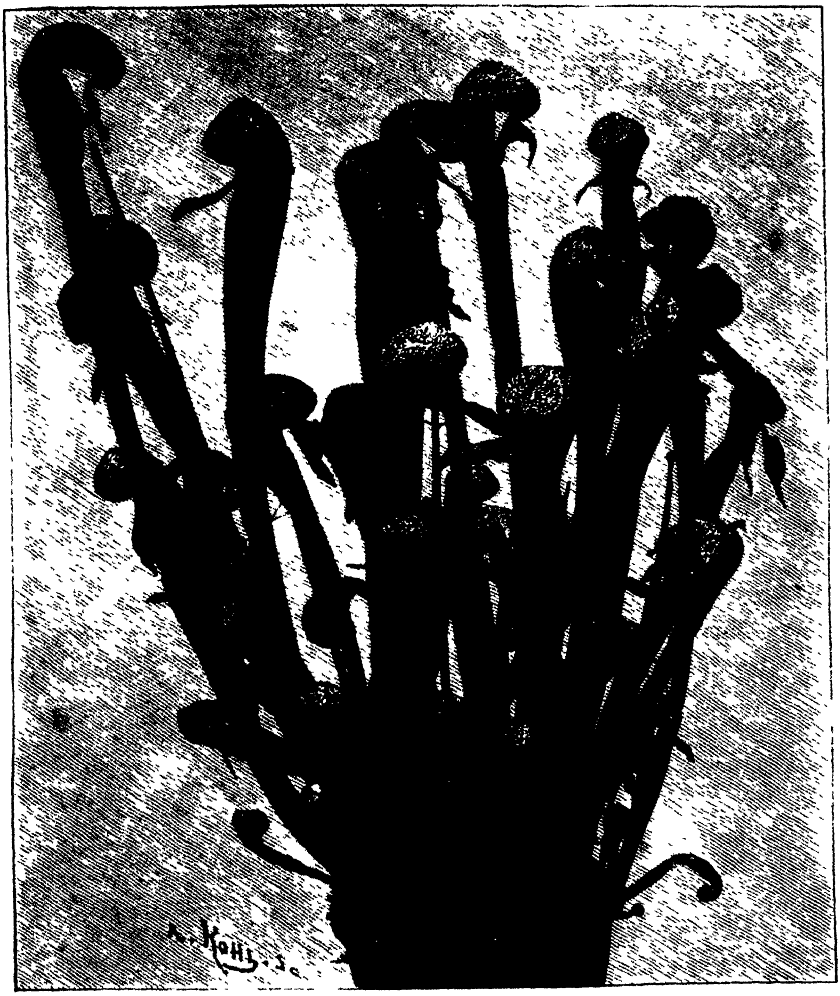
DARLINGTONIA CALIFORNICA.

A most singular greenhouse plant, nearly allied to the Sarracenias, and even more curious in the formation of its leaves, which are hollow like those of Sarracenias; in appearance they are most like S. variolaris, being hooded at the top like that species, but its leaves attain a much larger size, being, in a well grown example, as much as 18 or 20 inches high, and proportionate in circumference. The white and red variegation is very beautiful when the cultivation is such as to bring out the true character.

The method of propagation is similar to that advised for Sarracenias, which see. Being a swamp plant, like the Sarracenias, it must have an abundance of water while making growth, and at no time must it be dry at the root. It will not bear as much warmth as even the coolest kinds of Sarracenia like; a cold frame with the pots plunged in some moisture-holding material, and the lights tilted so as to admit abundance of air, is what it likes; or it will succeed in an airy greenhouse without any shade, as plenty of sun is needful to bring out the full amount of colour in the pitchers. It comes from California.

DASYLIRION.

These are very slow-growing evergreen greenhouse Bromeliaceous plants, with a singular but elegant habit of growth. They form thick short trunks, like those of Cycas revoluta, and kindred species; the stems are slowly developed, being formed as the leaves, which are very persistent, die off. The leaves of Dasylirions are long, narrow, and bayonet-shaped, and armed with spines along their whole length, erect at first, but as they get older assuming an elegant arched drooping position. The most singular matter connected with Dasylirions, is that from the first of the leaves issuing from the stem the extremities for an inch or two are dead, the dead part as the leaves get older splitting up into thin filaments and reflexing, assuming the appearance of a small brush, giving the plants a most distinct and singular aspect. They are handsome decorative plants for a conservatory, and equally useful for standing out on a terrace or lawn in the summer time, the hard texture of their leaves fitting them well for exposure in the open air in this way. They are increased by suckers which are produced sparsely from the base of the stem of old plants, or from a large example that has bloomed, the flowering usually having the effect of causing the production of suckers. These suckers should be taken off when they have formed several small leaves, say about 6 or 8 inches long; and the tufts of leaves, with a bit of stem attached, should early in spring be cut clean away from the old trunk, and put singly in pots sufficiently large to hold them, filled with half sand and sifted loam. Stand them in a temperature of 60°, shaded



DARLINGTONIA CALIFORNICA. *To face page* 142.

and moderately close, but not confined under a propagating glass or frame, which would most likely cause their destruction. Shade and give no more water than will just keep the soil slightly moist. The suckers will form roots and get established through the summer; winter in a temperature of 45°, and in spring, if the soil is filled with roots, move them into pots 2 inches larger, using good loam with a moderate quantity of sand added. The plants, as already said, are very slow growers, and from this time onwards will require nothing more than the usual routine of greenhouse treatment, with water given freely to the soil through the growing season, but more sparsely in winter, during which time they may be kept at about 40° in the night. If sufficient root-growth is made to admit of their being put into pots a size or two larger each spring, they must have this attention ; if the progress is slower than this only pot each alternate spring, regulating the size of pots by the progress made. As they get large the shifts should be larger and not so frequent ; large specimens, say when they get into 18 or 20 inch pots, will do a number of years without moving if given manure-water during the growing season. There are several forms, differing principally in the length of the leaves, and their dense or sparse production.

The following are distinct and desirable kinds :—

D. acrotrichum. A kind with long arched green leaves. A native of Mexico.

D glaucum. The leaves of this sort have a bluish metallic hue. From Mexico.

D. gracile. Is distinct in appearance from both the above. Mexico.

D. latifolium. A handsome form with stout foliage. A native of Mexico.

INSECTS.—The hard texture of the leaves of Dasylirions is such that few insects molest them, except scale, which, if troublesome, can be removed by sponging.

DAVALLIA.

This genus is amongst the finest of creeping stemmed Ferns ; it comprises both stove and greenhouse kinds, and contains a large number of species, from the elegant little D. Tyermanii to the noble D. Mooreana, and D. polyantha. The magnificent fronds of both of these species extend under liberal cultivation to a length of 6 or 7 feet. The stout, heavily-clothed, creeping stems of many of the Davallias is not their least attractive property ; in D. canariensis this appearance is so marked as to give it the name Hare's-Foot Fern.

For propagation and cultivation, see Ferns, general details of culture.

STOVE SPECIES.

D. aculeata. West Indies.
D. fijiensis major. Fiji Islands.
D. Mariesii. Japan.
D. Mooreana. Borneo.
D. polyantha. Java.
D. Tyermanii. Africa.

GREENHOUSE SPECIES.

D. bullata. Nepal.
D. canariensis. Canaries.
D. canariensis pulchella.
D. dissecta. Java.
D. elegans. Malay Archipelago.
D. heterophylla.
D. pyxidata. New South Wales.
D. tenuifolia. East Indies, Japan, and China.

DAVIESIA.

Evergreen greenhouse plants that used to be much more frequently met with when hardwooded subjects were more in favour than of late. They are distinct in the appearance of their flowers, but not equal to many things requiring to be grown under similar conditions. They succeed with treatment such as recommended for Chorozemas, which see.

The following will be found to sufficiently represent the genus :—

D. cordata. A very distinct looking species, bearing in summer numerous corymbs of yellow flowers. It comes from New Holland.

D. latifolia. This species also has yellow flowers, borne in racemes ; a summer bloomer. From New South Wales.

DESFONTAINEA SPINOSA.

The handsome appearance that this plant has even when not in bloom, densely clothed as it is with bright green, Holly-like foliage, renders it at all times interesting, and when studded with its brilliant crimson and yellow flowers it is one of the most distinct and attractive subjects in cultivation. When, in addition to its other good properties, the plant is found easy to manage, it seems strange that we do not much oftener meet with it ; but this may be explained by the fact that to flower it well the usual treatment given to the generality of greenhouse plants will not answer. The wood when grown under ordinary conditions appears never to attain a sufficiently hard, ripe state to induce the free formation of flowers. It is one of a number of fine things that are thus consigned to neglect, simply through a want of consideration of the conditions under which they exist naturally, and which to some extent must be imitated under cultivation if success is to be attained.

The plant is a native of Patagonia, where, according to Dr. Hooker, it occupies a position some 12,000 feet above the level of the sea; from this it may be easily supposed that it is hardy in some parts of the kingdom. Many plants will flower freely even when their growth has been made under the necessarily somewhat confined condition of the air in a greenhouse during the spring months, if they are later on in the season subjected to a hardening process out-of-doors, whereby the wood is ripened; but in the case of others, such as this Desfontainea, the growth of which is somewhat slow and the wood and leaves of a very hard nature, unless the growth is made under conditions that ensure its being fully solidified as it is formed, no amount of exposure to sun and air afterwards will make up the deficiency so as to enable it to set and produce flowers in quantity. This will be understood by growers of Cape Heaths, some of which—notably the species depressa—can never be induced to flower freely unless the greater portion of the growth is formed in the open air. With this kind the usual exposure out-of-doors in the latter part of summer will not suffice; the plant, if it is to bloom well, requires its growth to be in a great measure made in the open air, fully exposed to the sun all through the summer. This is more fully exemplified in the case of Desfontainea, which should be stood out-of-doors from the time the frosts are over in the spring until the autumn is far advanced, although this may not be advisable in the case of small plants, it being better to keep them under glass until they have attained some size, as in this way they will make quicker progress. It is free in forming roots, and will succeed in either peat or loam, but the latter is usually more conducive to the free production of flowers.

The plant is propagated from cuttings of the young shoots in a semi-ripened state, taken off about August, and put 2 or 3 inches apart in good-sized pans in sand, covered close with a propagating glass, kept moist and shaded in a cool house or pit through the autumn and winter, during which time the base of the cuttings will callus. About March put them in a little warmth, when they will soon root. By June they will be fit to place singly in 3-inch pots, and should be kept a little close until they have begun to grow; give more air in the autumn, and winter in a greenhouse or pit. About March pinch out the tops of the shoots, and as soon as they show signs of growing move into pots 3 inches larger. Select the best turfy loam, retaining all the fibre; add as much sand as will keep the soil for years in a sufficiently porous condition, for an evergreen of this description will not well bear any of the soil being removed from its ball, and as it is a plant that will last for a number of years with fair treatment provision should be made in having a material that is not likely to soon get into an unhealthy state. Drain the pots well, and ram the soil so as to make it firm; during this spring and summer keep them along with the general stock of young hard-wooded plants, encouraging growth by closing the house early enough to secure for a few hours a warm, growing temperature made sufficiently moist by sprinkling water about and syringing the plants overhead. They are not liable to become drawn, but should, nevertheless, be stood where they will get plenty of light, or the base of the plants will not be properly furnished; the somewhat rigid character of the shoots make them more difficult to bend, yet from the first they should be trained out or the bottom will ultimately become naked. So far as possible get the strongest shoots thus well out and as low down as can be at the commencement. As the roots enter the new soil freely give more water, for, like most plants from a high altitude, they do not like to be kept too dry; they require only enough shade to prevent the leaves burning. Continue this treatment through the summer until the middle of August, when turn the plants out-of-doors in the full sun, protecting the pots from its direct force. They may remain out until the end of September, after which remove them to a house or pit where frost will be excluded; give just as much water as will keep the soil in a healthy state. In March go over the plants and shorten back slightly any shoots that are taking an undue lead of the weaker ones; in April again give them fresh pots, proportioning the size of the shift to the root-progress they have made, and using similar soil in a little rougher state; the shoots should now be well tied out, so as to secure handsome symmetrical specimens. Do not keep the atmosphere too close, as it is not desirable that much tender growth should be encouraged, as it would be liable to suffer from sudden exposure in the open air, to which the plants should be removed towards the end of May; again place them in the full sun, but screen the pots from its influence; give regular attention in watering and syringing overhead in the evenings during bright weather, and occasionally turn the plants round so that all sides alike may come under the sun's power.

Continue this treatment until the beginning of August, when discontinue the use of the syringe; let them remain out until the end of September, when they must be brought in and wintered as before. It must now be determined whether they are to be used for indoor decoration, with what bloom they will make, or be grown on another season; the latter course will generally be most advisable, and if decided upon they should be again potted in spring, turned out as in the last season, and any shoots that need it stopped. If they are removed to the conservatory during the time of flowering their next year's bloom will be interfered with, as the plant can seldom be induced to produce a full sheet of flowers on two seasons consecutively. Again in the autumn remove them inside; the shoots will now require a few sticks to keep them in shape, although comparatively little support is needed. It will be better not to pot in the spring, as it may in some measure interfere with their flowering, but turn them out about the same time; they may be expected to bloom freely during the summer, at which time the plants can be used in the conservatory or greenhouse, but there should not be shaded more than required. If they appear to want more pot-room, they should have a shift after the flowering is over, placing them out-of-doors as soon as they have got hold of the new soil if the season is not too far advanced—if it is, they had better be kept under glass and treated through the winter as before advised. Again in the spring expose them in the open air; they will most likely not produce a full crop of flowers this season if kept long indoors during the previous summer—the object should be to prepare them for making a full display the ensuing year. It can easily be arranged to bloom a certain number each summer. By preparing them in the way described the plants will last for many years, if given increased root-room as they require it, and they can be kept in a vigorous, healthy condition with less pot-room if they are assisted through the growing season with manure-water.

INSECTS.—The hard texture of the leaves renders them little subject to the attacks of the smaller insects; should they appear they can be easily removed by a free use of the syringe; if brown scale gets upon them sponging may be resorted to with effect.

DESMODIUM GYRANS.

(The moving plant.)

A warm stove species, belonging to a family of plants most of which possess little beauty. Nor can it be said that this has anything effective in its flowers; the interest attached to it lies in its leaves, which are constantly moving with the regularity of the pendulum of a clock, only much slower and in a different direction, the motion being alternately upwards and downwards. This continuous motion has given rise to a good deal of speculation as to the cause among those interested in vegetable physiology; its motion is not nearly so quick as that of the sensitive plants—Mimosa sensitiva, M. pudica, and others of that genus. True it is that this and other plants possessing singularity of habit rarely have flowers with fine colours, but it is well that they should not be lost sight of by cultivators; of this there is some danger through the disposition that too often exists to give exclusive attention to things that are only noticeable for their highly-coloured flowers.

The cultivation of this Desmodium is extremely simple, as all it requires is a brisk heat and ordinary attention in the matters of soil, water, and air, and a little shade in bright weather. It strikes freely from cuttings of the half-ripened wood taken off at any time of the year when obtainable. If its propagation is undertaken in the spring, cuttings consisting of points of the shoots a few inches in length cut to a joint, put singly in 3-inch pots, in sandy soil, the surface all sand, placed in a temperature of 70°, covered with a propagating glass, and kept moist and well shaded, will soon make roots. Then dispense with the glass, and stand the plants in a fairly light place; as soon as the small pots are filled with roots give them a couple of sizes more room, using ordinary loam, to which add a little sand and rotten manure. Pinch out the leading shoots to cause them to break side branches, and give them ordinary stove treatment as to heat, light, water, and air, shading slightly when the weather is sunny. The plants soon begin to show the natural peculiarity of their leaves, and keep on moving regularly, the base of the stalk acting just like a hinge. All that is further required is an increase of pot-room when the soil gets full of roots. The plant attains a height of about 3 feet, and does not need a great deal of room. It deserves a place in the gardens of those who are fond of singularities in the way of plants. It comes from India, and therefore likes a considerable amount of heat at all times.

INSECTS.—Aphides and red spider, as well as others of the worst description of insects that prey on stove plants, will sometimes attack this Desmodium; the daily use of the syringe during the growing season will generally suffice to keep the smaller ones in check. Should scale or bug affect the plants, sponge with tepid water.

DICHORISANDRA.

These are very distinct-habited stove plants indigenous to Brazil and South America; they are evergreen herbaceous in habit, with strong Reed-like stems, growing to a height of from 2 to 4 feet, and bearing broad, lanceolate, cordate leaves; the flowers are produced in a compact cluster at the top of the shoots. They are principally late summer and autumn bloomers, at which season their decided blue flowers—a colour common to most of the species—are very effective. They are easily grown where a moderately high temperature can be kept up, and are well adapted for associating with most of the more easily cultivated hothouse plants, to which their erect habit presents a decided contrast.

Their propagation is in no way difficult; they are best increased by division of the crowns, which can be separated readily with a strong knife, retaining to each a portion of roots. This should be done early in the spring, just before they begin growth, which will, as a matter of course, be regulated by the amount of warmth the plants have been subjected to during the winter—their season of comparative rest. We have found them to succeed best in peat to which has been added a moderate quantity of sand. When the crowns have been thus separated, they should be placed in pots large enough to admit their roots with sufficient soil; if they are strong, 6-inch pots will not be too large. Put them at once in a temperature of 65°, or a few degrees higher in the night. They will soon begin to grow, after which supply them liberally with water. Stand them where they will get a full volume of light, for if kept too dark the shoots will be drawn up too tall. In the matters of air and shade, treat as for ordinary stove plants, syringing them freely overhead when the house is shut up in the afternoons. By the middle of May the plants should be ready for larger pots; 8 or 9 inches in diameter will not be too big, using soil similar to that already advised. Through the summer they will bear a liberal amount of heat such as is found to answer for most stove subjects, regulated in accordance with the weather. Beyond this nothing further will be required. The strongest of the plants will flower through the autumn, after which they may be subjected to a gradually reduced temperature, keeping them at about 60° in the night through the winter. In spring again give more heat and repot, giving them a 2 or 3 inch shift, treating subsequently in other respects as advised for the previous summer. In years to come the size of the plants will be regulated by individual requirements; they may be grown large, so as to have a dozen or more flowering stems each season, in which case the root-room needed will be proportionate. The old stems should be cut away annually to make room for the young growth.

As to the kinds grown, there is a considerable sameness in their appearance; consequently it is not necessary nor advisable to cultivate too many. Among the most desirable are the following:—

D. albo-marginata. Stems of moderate strength. Flowers white and blue. From Brazil.

D. mosaica. Three to 4 feet high. Beautiful deep blue flowers, borne on handsome Bamboo-like stems; the foliage bold and distinct. A native of the Amazon country, and one of the best of the species.

D. Saundersii. Stems 2 to 3 feet high. This makes dense racemes of white violet-tipped flowers. Introduced from Brazil.

D. thyrsiflora. A strong grower, like those already named, of erect habit. It blooms in summer; flowers deep purple. Brazil.

D. undata. A stout-growing plant with Reed-like stems; the flowers blue, and produced in summer. From Brazil.

In addition to being deserving of cultivation on account of their flowers, all the above have handsome foliage.

INSECTS.—Their smooth glossy leaves do not afford much harbour for insects, of which the least difficult to contend with will be easily kept down by syringing. If scale or mealy bug make their appearance, syringe with insecticide and sponge carefully.

DICKSONIA.

A small genus of magnificent greenhouse Ferns, among which are several of the most favourite Tree species, including the well-known D. antarctica, and others nearly allied. D. antarctica is more largely cultivated than any other Tree Fern, its robust, hardy constitution befitting it for thriving well in a greenhouse. D. squarrosa is also a beautiful species, forming a straight, slender trunk, surmounted by an elegant symmetrical head of fronds.

For propagation and cultivation, see Ferns, general details of culture.

GREENHOUSE SPECIES.

D. antarctica. Australia.
D. fibrosa. New Zealand.
D. squarrosa. New Zealand.
D. Youngii. New South Wales.

DIDYMOCHLÆNA LUNULATA.

A very distinct-looking, dwarf Tree species of Fern, from South America, that will succeed in a greenhouse. It is often spoilt by being grown too warm, in which case the pinnules frequently drop off.

For propagation and cultivation, see Ferns, general details of culture.

DIEFFENBACHIA.

Many of these thick, succulent-stemmed stove Aroids have very handsome variegated leaves, differing considerably from most other fine foliage plants, and having a handsome appearance when associated with flowering and other ornamental-leaved habitants of a warm house. Most of those in cultivation are from the West Indies or the hotter parts of Southern America, and therefore require a good deal of heat to grow them. They are easily grown, and can be propagated in a warm house, without difficulty, from pieces of their succulent stems containing one or more eyes. They should be inserted so as just to cover the base in pots half filled with sandy soil, the remainder all sand, and kept in a brisk heat, but not too moist or they are liable to rot; nor is it well to keep the cuttings so close or confined as needful with most things. The eyes generally start into growth at the time roots are being pushed; when these are fairly formed the young plants should be moved singly into 5-inch or 6-inch pots in sandy loam or peat; either will do.

If propagation has been effected early in the spring the temperature should be increased as the weather gets hotter; 65° or 70° in the night, with proportionately more in the daytime, will do through the summer, during which season they cannot be kept too near the glass, if not absolutely touching it, but they must be protected from the sun with a thin shade, or the leaves will lose their healthy colour. Syringe overhead daily in the afternoons through the growing season, giving air in the middle of the day. This is all the attention they require beyond larger pots as the roots want more room. Where large specimens are wanted they may be had by heading back such plants as consist of a strong single stem, which will cause the stool to push out a number of shoots, or several rooted cuttings may be put together in a good-sized pot and treated in other respects as advised for the single-stemmed specimens. One season is generally long enough to keep the plants, as their leaves are not very persistent, and after the first summer they usually get bare at the bottom unless cut back and started afresh, striking the tops and such portion of the stems as required in the way already indicated. By the use of manure-water large plants can be grown in comparatively small pots.

The following is a selection of the best and most distinct kinds:—

D. amœna. Deep green leaves, mottled with white and yellow.

D. Baraquiniana. Has handsome green leaves blotched with white; the leaf-stalks are also white.

D. Carderii. Leaves deep green, about half the surface covered with large irregular white blotches.

D. Chelsonii. Green ground coloured leaves, with greyish-white nerves, and clear yellow mottling.

D. Leopoldii. A distinct and handsome sort, the leaves of a very deep green shade, extremely lustrous; the midrib has a broad ivory white band running its entire length.

D. Wallisii. Ground colour deep green, the central nerve greyish-white, with white blotches on the leaf.

There are many others differing slightly from these, but the above are sufficient for ordinary cultivation

INSECTS.—Dieffenbachias are little subject to insects. Red spider and aphides will live on them, but can easily be kept down by syringing.

DILLENIA SPECIOSA.

An evergreen stove shrub or small tree. It is only fit for growing in a large stove, where the intention is to illustrate so far as possible under glass the character of tropical vegetation. The leaves are quite a foot long. The flowers, which are white in colour, are 8 or 9 inches in diameter, but are rarely forthcoming in cultivation.

It is increased by cuttings of the shoots, which require a strong heat to strike in, with the usual conditions of a moist confined atmosphere. After roots are formed the plants must be grown on in a warm stove, and as they get large they will want plenty of root-room either by being put in large pots or planted out. It thrives in sandy loam. Introduced from India.

INSECTS.—This Dillenia is subject to most of the insects that affect stove plants. Syringe with water and fumigate for the less objectionable kinds; for mealy bug and scale syringe and sponge with insecticide in the winter when the plant is dormant.

DILLWYNIA.

This is a genus of hardwooded greenhouse plants, of a bushy habit, that bloom freely in the spring and summer. The flowers are yellow, or reddish-brown, pretty, but not nearly so attractive as many species that come from the same countries—New Holland, New South Wales, or the adjacent parts. Dillwynias were at one time much more grown than at present, having given way to things more showy in appearance. The method of propagation and the after treatment given for Boronias—which see—will answer for Dillwynias. The undermentioned are the most deserving kinds:—

D. floribunda. Yellow.
D. juniperina. Yellow.
D. pungens. Yellow.
D. rudis sanguinea. Red.
D. speciosa. Orange and yellow.

DION EDULE.

A very handsome evergreen plant. It belongs to the Cycad family, and requires the same treatment as the warm species of Cycas. The pinnæ of the leaves are as regular as the back-bone of a fish; the leaves in a strong specimen will attain a length of from 5 to 6 feet. A native of Mexico.

DIONÆA MUSCIPULA.

A most curious little warm greenhouse plant, differing from all others in the remarkable formation of its leaves, which terminate in a singular trap-like appendage, furnished with internal hairs, which, so long as the leaves are healthy and vigorous, are extremely sensitive, and when touched cause the jaws of the trap to close instantly. This is one of the most remarkable of the insectivorous plants, so called from the provisions which Nature has given them to attract and confine insects, which latter are with good reason supposed to afford them nutriment.

It is increased by division; when the plant produces a flower-stem this causes the bulb-like base to divide as in the case of Lilies and many other plants. The offsets should be separated in the spring before growth begins, and put singly in very small pots filled with a mixture of fibrous peat and chopped sphagnum, with a little sand and small crocks added. The plant requires plenty of water through the growing season, and must never be allowed to get dry. It thrives best with a little more warmth than that of an ordinary greenhouse, but does not like a stove heat. It should have plenty of light, but ought not to be stood too near the glass, or be exposed to the sun. The little pots in which the plants are grown must always be kept plunged up to their rims in sphagnum, in a pot or pan large enough to hold a moderate body of the material; this is needful to keep the roots in a uniformly moist condition; ten or twelve plants plunged in this way in a pan 12 inches in diameter, make a nice specimen. The plants are better not grown under a bell-glass as sometimes advised, as even if kept tilted the glass tends to weaken the growth. It is a habitant of the swamps of North Carolina and Florida.

INSECTS.—Aphides are particularly partial to Dionœa, and must never be allowed to remain on it, or they will quickly destroy the leaves; fumigation with tobacco is the best remedy.

DIOSCOREA.

Strong-growing stove climbers, suitable for training round a pillar, or more so for clothing a wall, where such plants as are grown for the production of flowers might not get enough light. They are rapid growers, soon covering a considerable space; the leaves of the kinds hereafter named are handsomely variegated, although not so bright in appearance as some things used for a like purpose.

They are increased by division of their tuberous roots in the spring before they begin to grow; pot, and grow them on under ordinary stove treatment; and give as they increase in size enough root-room either by large pots, or by planting them out in a bed. They will thrive in either loam or peat.

D. Anœctochilus. A bold-leaved species, and a free grower that will cover a large space if given enough root-room to enable it to attain its full strength. The ground colour of the leaves is green, mottled with golden yellow. From South America.

D. argyræa. A species of medium strength, the leaves prettily marked along the nerve margins with silvery-grey. From Colombia.

D. discolor. A handsome species, with large leaves, prettily mottled. It comes from Central America.

D. discolor vittata. A pretty kind, the ground colour of the leaves is green, with a silvery-grey central band. From South America.

D. illustrata. A handsome sort, ground colour of the leaves green, with an irregular silvery band down the centre, and numerous irregular blotches and spots of the same colour dispersed over the entire surface. A native of the Rio Grande du Sul.

INSECTS.—Mealy bug and aphides are the only insects we have found troublesome on these plants; to remove the former syringe freely with clean water; for aphides, which sometimes affect the points of the young shoots, fumigate.

DIPLADENIA.

Few plants better deserve general cultivation by all who possess a warm stove than Dipladenias. They are of moderate growth, and when well managed may, if required, be induced to flower continuously from the end of April to December. It is not, however, desirable to allow them to bloom so long, having in view the preparation of the plants for the ensuing year's flowering; yet if wanted so late in the autumn, all that is necessary is to defer cutting the plants back, and to keep up sufficient heat to induce the formation and expansion of the blooms. For bouquets, either half or fully expanded flowers of the lovely rose-coloured D. crassinoda, the white, yellow-throated D. boliviensis, or the beautiful blush-tinted D. Williamsii, with its deep rosy throat, have few equals; for vases or shallow stands these and also the darker varieties are among the best flowers that can be used, furnishing, as they do, for a long period, a daily supply of blooms of the most refined and distinct character. But in gathering them to be thus used for decorative purposes, care should be taken to cut only the individual flowers with their foot-stalks. It is extravagant to remove the whole bunch, for if allowed to remain on the plant, flowers will keep expanding for some months. The best, most distinct, and desirable kinds have been raised from D. crassinoda, crossed with D. splendens. Some of these are much darker in colour than either of their parents.

In the cultivation of Dipladenias one point should not be lost sight of, and that is **the necessity of a brisk temperature.** ***D. crassinoda comes from the hot low-lying districts of Rio de Janeiro, D. splendens from the foot of the Organ Mountains; consequently neither the species nor the varieties*** raised from them can be expected to succeed without plenty of heat. To flower early in spring they should be kept through the winter at from 66° to 70° during the night. They are easily struck from cuttings made of the young shoots, either consisting of one or a couple of joints. These may be put in any time from spring to September, but the wood is in the best condition for making cuttings after the beginning of August. Place them singly in small pots half filled with fibrous peat and sand, the upper part all sand; keep them moderately close under a propagating glass in a temperature of 70° or a little over. They will soon strike. When well rooted, dispense with the glasses, and after the young growth has made some progress move them into 4-inch pots, using the best fibrous peat and a good portion of sand. Encourage them to make root and some top-growth before winter, during which time they should be kept slowly moving in a temperature as near 70° as can be given them. In the spring, about the beginning of March, move them to pots 3 inches or 4 inches larger, using in all stages of their growth nothing but good fibrous peat and sand. This is more suitable for them than any mixture of peat, loam, leaf-mould, or other combination. The peat cannot be too fibrous, and after the plants are moved from the 4-inch pots, it should be used in a lumpy state, the pieces not being broken smaller than bantams' eggs. Good peat of this description should have mixed with it one-sixth part of sand. Drain the pots well, pot moderately firm, and do not give water until the soil has become drier than would be advisable for most stove plants. Take half a dozen sticks 3 feet in length, and insert them in the soil just inside the pot; round these wind the shoots, leaving the points well up, or they will throw out too many side breaks, and keep them through the remainder of the summer in a warm stove, for they will bear as much heat as any plants living. Syringe them overhead every afternoon, getting the water well to the underside of the foliage, as they are subject to red spider as well as to scale and mealy bug. By the middle of October move them into 12-inch or 13-inch pots. In potting this time do not disturb the roots any more than is necessary to remove the drainage; the soil should be similar to that used for the previous shift.

Untwist the plants from the sticks to

which they have been attached, and at once put them on the trellises on which they are to be grown; these should be made of strong galvanised wire 2 feet 3 inches through by 2 feet 6 inches in height above the pot. These trellises may appear small, but they look very bad when not well covered with foliage, and the bunches of flowers, which should never be tied in too stiffly, will project on all sides to a distance of 6 inches or 8 inches from the trellis, making the plants large enough for any purpose. The ends of the wire ought to be 9 inches longer, so as to have sufficient hold of the soil, and should be inserted just inside the rim of the pot and fastened securely by stout sticks. These should come half-way up the inside of the trellis, and be secured to it to keep the whole firmly in its place; without these sticks the trellises are liable to swing about and injure the plants when moved. Train the shoots evenly round the trellis, taking care to furnish the bottom first. Growth from this time until the days lengthen will be somewhat slow. Through November, December, and January keep the night temperature nearly up to 70°, with a rise of 5° in the day. A good bed of tan is of great advantage to the plants, which should stand above it; Dipladenias should never be plunged. They are very impatient of any excess of moisture at the roots, and when plunged it is not always easy to tell when they require water; it also makes them much more tender by the way in which it acts upon them, and in most houses they are, when plunged, too far from the light Run the shoots up thin strings fastened from the trellis to the roof, keeping them in this position until they have begun to open their flowers. By the end of February the night temperature may be raised 3° or 4°, and about the beginning of April it can be allowed to run up to 85° or 90° in the day with sun-heat, which will answer through the summer; admit a little air, but allow no cold currents to come in contact with the plants. Close early, syringing at the same time. As the sun gets powerful, the flowers will be benefited by a little shade in the middle of the day, but the plants do not require it. When the bunches begin to open, train the shoots neatly round the trellis, so as to have it covered uniformly with foliage and flowers. Assist the plants with manure-water all through the season from this time, and they will keep on throwing out fresh shoots that will show bloom when from 12 inches to 18 inches in length. Do not allow these to get twisted together, and give more air during the summer. They will, if all goes on well, continue to bloom freely through the summer. At the end of September they should be taken off the trellises, and the shoots cut back to within 6 feet of the collar, tying them loosely to a few sticks inserted in the soil. The temperature now should be about 65° by night. In three weeks they will have broken sufficiently for moving; then turn them out of the pots and reduce the ball quite one-half, removing as much of the old soil as is possible without injuring the roots. Place them in 15-inch or 16-inch pots, which size is large enough for any Dipladenia, as, owing to the annual renewal of so much of the soil, they do not require more room than this. In potting, always keep the collars of the plants well up, only just or barely covering the tuberous portion of the roots, by which means they are not nearly so liable to suffer in this their most tender part. At once place them on the trellises again, and treat in every way as recommended for the preceding year. Dipladenias can be grown somewhat cooler than has just been recommended; but to get as much and as long a continuance of flower from them each season as they are capable of, they need to be treated as above. All make beautiful climbers for draping the roof of a stove, the splendid colour of their flowers being seen to the best advantage thus hanging; but even when grown in this way they should not be planted out, as they succeed best in pots where the soil can in a great measure be removed each year. In growing Dipladenias it is necessary to keep the soil drier than in the case of most stove plants.

The following well deserve a place in every stove:—

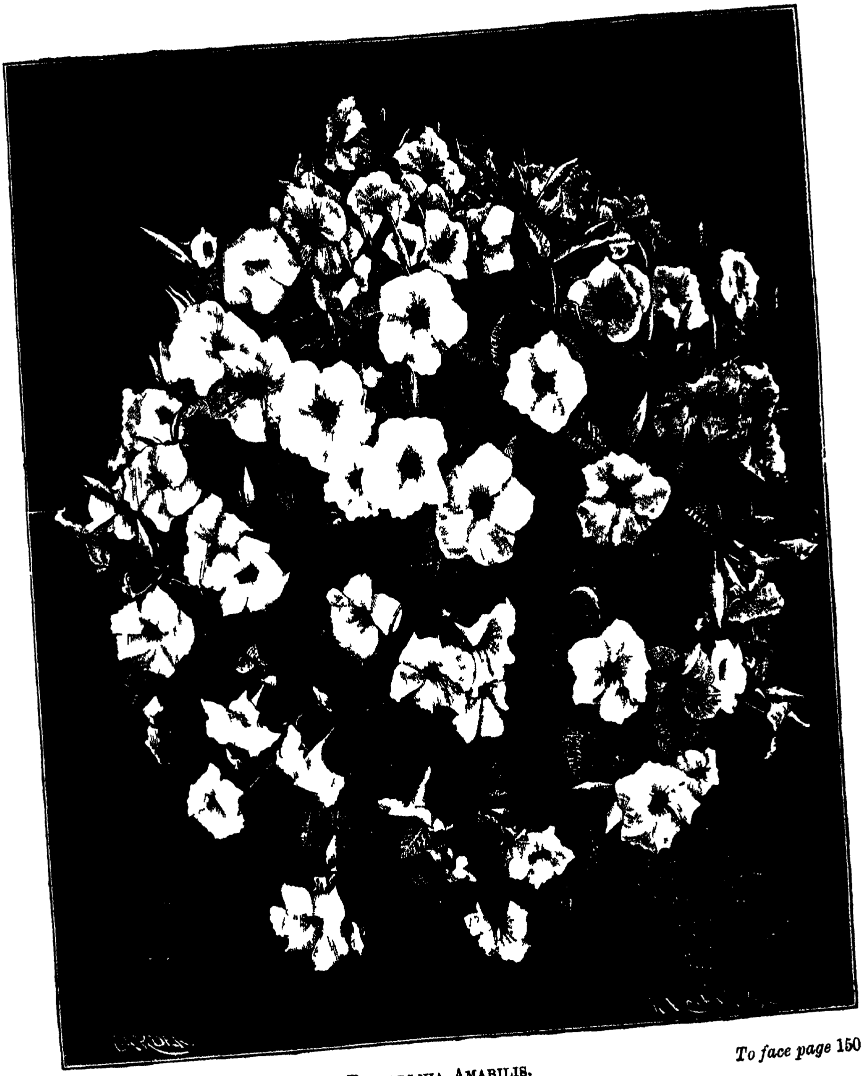
D. amabilis. An excellent free-flowering sort, the blooms distinct in colour, deep rose, with ample foliage. One of the best plants in cultivation.

D. amœna. A free-flowering variety, with pale, flesh-coloured flowers, which are produced in medium-sized bunches.

D. boliviensis. Bears delicate white flowers much smaller than either of the preceding, and is very distinct from them.

D. Brearleyana. This has very large flowers, from three to four being open on each bunch at a time. The colour is not easy to describe. It is, when properly brought out, extremely rich, differing from any other flower we ever saw—an intense deep reddish-crimson, with a lustre like a dark velvety Rose. The plant has fine dark-green leaves, is a remarkably robust grower, and equally free flowerer.

D. crassinoda. A more slender-habited plant than the preceding, with thinner



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Dipladenia Amabilis.

wood and smaller glossy leaves. Its beautiful rose-coloured flowers, which are produced freely, are well set off by the yellow throat. We have had a plant of this variety with 150 bunches of bloom upon it at once.

D. Houtteana. A distinct, pale-coloured kind, with medium-sized flowers produced freely.

D. hybrida. Amongst all the species and varieties in cultivation this stands unequalled for the brilliant colour of its flowers, which are of the most glowing shade of crimson, large in size, and stout in texture. The plant has a robust appearance, with stout handsome foliage, and blooms freely.

D. insignis. A fine variety, with deep rosy-crimson flowers of great substance. The leaves are large, and set off the plant to advantage.

D. magnifica. Is somewhat like the species D. crassinoda, but the flowers sometimes come handsomely marbled with white.

D. profusa. A free-growing, very free-flowering kind; the individual blooms very large; carmine in colour.

D. Regina. A medium grower, with blush-coloured flowers when first opened, becoming paler as they get older, but deeper coloured in the throat; a free-blooming variety.

D. splendens. One of the oldest, but still a very fine kind. The flowers are white, suffused with pink, very beautiful, and borne in large bunches. It is a strong grower, with large bold foliage. From the Organ Mountains.

D. Williamsii. This is an improvement upon D. splendens, the ground colour, as in that variety, being pale blush, with the addition of a deep pink throat, which much enhances its beauty. It blooms freely, and is one of the most chaste flowers that we have.

INSECTS.—All the most troublesome insects which prey upon cultivated plants are partial to Dipladenias; mealy bug, scale, and thrips all infest them, and require to be kept under by diligent attention and frequent washing with insecticide.

DIPTERACANTHUS.

This is one of the numerous genera which the natural Order Acanthaceæ includes; it contains a few species worth growing. Like most of their allies they are easily grown, requiring the same treatment as advised for Justicias, which see.

D. affinis. A scarlet-flowered species, which blooms in winter. It comes from Brazil.

D. Herbstii. This kind bears handsome crimson and purple flowers, produced in autumn. From Brazil.

D. spectabilis. Has blue and purple flowers, and is a winter bloomer. Introduced from Peru.

DISANDRA PROSTRATA.

A greenhouse trailing plant that bears small yellow flowers, produced in the summer. It is occasionally met with as a climber.

It can be struck from cuttings in spring in the usual way, in moderate warmth, and grown on in the ordinary manner until large enough to plant out or to occupy a moderate-sized pot; train the shoots on the space to be occupied. A native of Madeira.

INSECTS.—Insects do not trouble this plant much, except red spider, which can be kept down by syringing regularly through the growing season.

DORYANTHES.

The known species belonging to this genus of greenhouse Amaryllidaceous plants are few in number. They have a noble appearance when in flower; their bloom-stems springing from a tuft of recurved leaves have a decidedly distinct appearance. They can be increased by suckers, which are produced from the base of the old plants, like those of the hardy Yuccas. They require to be taken off, potted, and grown on under general greenhouse treatment in the matter of warmth, moisture, and air, such as found to answer for other things coming from the same country.

D. excelsa. In its native habitation this species is said to make flower-stems 20 feet high; the flowers are produced in large heads on the tops of the stems; they are crimson in colour, and are furnished with bracts of the same hue, which much enhances the effect. It comes from New South Wales.

D. Palmerii. A newer species than the last-named, and superior to it as a decorative plant. The flowers are produced in the form of a pyramidal, erect, branching spike, half a yard high by a foot through. The individual flowers are red with a light centre, almost approaching white. It comes from Queensland.

DRACÆNA.

(Stove.)

Among the stove species and varieties of Dracæna are to be found some of the most beautiful and distinct variegated plants in cultivation, alike remarkable for the charming colouring of their foliage and the elegance of their habit; they are adapted for the warm conservatory or the greenhouse in the summer, or the numerous decorative purposes in rooms for which plants are now so extensively used. The narrow-leaved kinds are the most elegant, but some of those with massive broad foliage are very effective when associated with Ferns or flowering plants, and in these ways can be employed to the best advantage.

All the warmer section will bear a stove temperature and are free growers, but do not progress so fast as to be of a weedy character; they are easily propagated, but not being plants that break out side-shoots, they do not afford material to make stock so quickly as many things do. They yield cuttings from the roots differently from most plants; the feeding fibres proceed from a stout underground stem, thick and blunt at the extremity, which extends downwards, soon reaching the bottoms of the pots. If 2 or 3 inches of these stems are cut off and put points upwards in small pots, they will soon push growth, and, forming leaves, make plants similar in every way to such as are the result of striking the tops of the plants. The latter, if taken off with four or five leaves, root in a warm close atmosphere in a few weeks, but the most expeditious mode of increasing Dracænas is to take the stems of any old plants that have attained a considerable height, and in such condition have generally lost their lower leaves; if these are divested of the roots, the soft portion of the top and all the leaves, and are laid down in a propagating frame where there is a good bottom heat, on a bed of open sandy peat, with about half an inch of similar soil over them, most of the eyes will start into growth and push up sucker-like shoots. As soon as these have made three or four leaves each they should be cut clean off from the old stem with the roots attached that the young growths will have formed; they should be put singly in small pots in sandy peat and kept close and shaded for a week or two, when they will soon get established, and must then be inured to the full air of the house. Dracænas are not liable to become drawn or weakly, but their leaves are handsomer and more enduring when they are grown with enough light and have a sufficient amount of air every day during summer. Plants raised in the above way early in spring will, if kept growing in a brisk heat, be ready for moving into 4-inch pots by the end of June, after which continue to treat them as before, giving plenty of water so long as the season of growth continues. Syringe freely overhead in the afternoons at the time the house is closed. In the night through the winter a temperature of 60° is sufficient; in the spring increase the warmth day and night, and as soon as growth commences move them into pots 3 inches larger, treating as in the previous summer. Additional root-room as wanted must be given proportionate to the requirements of the different kinds grown; such large growers as D. Shepherdii and Baptistii need much larger pots than the smaller sorts. The plants may be kept growing to any required height so long as they retain their lower leaves; after the loss of these they possess little beauty, and should have their heads taken off and struck, and young stock raised from the stems. Three years is generally as long as the plants can be kept fairly furnished with bottom leaves. Comparatively small examples in 6 or 8 inch pots are the most useful for ordinary decorative purposes. There are now an immense number of species and varieties, many differing very little from each other.

The following is a selection of the best heat requiring kinds:—

D. albicans. A very distinct and handsome sort; leaves bright green, variegated with white. South Sea Islands.

D. amboynensis. Handsome in habit, the lower portion of the leaves heavily edged with bright red. Amboyna.

D. angusta. A handsome small-growing kind; leaves 1 inch wide, dark clouded green, shaded with bronzy-red. South Sea Islands.

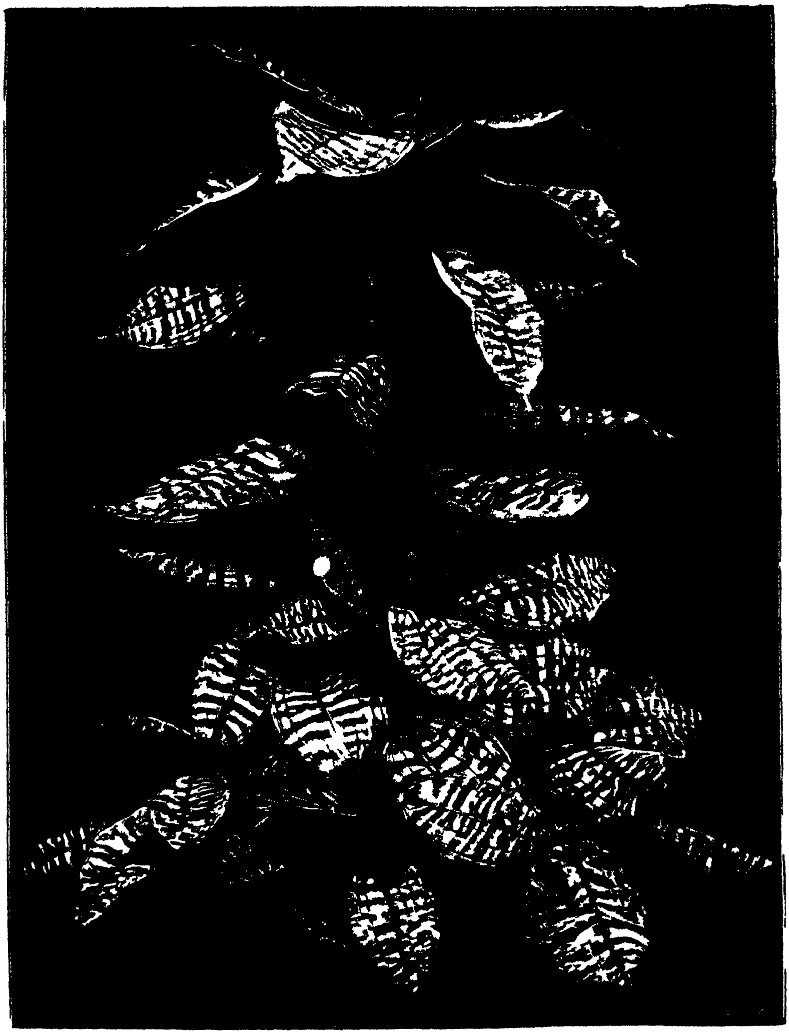
D. Baptistii. One of the finest of all the species. The leaves are large, and the general habit of the plant handsome. Ground colour, a peculiar shade of rich metallic green, edged with red suffused with white. South Sea Islands.

D. Bausei. A distinct and handsome variety of garden origin. It has stout, broad leaves, dark bronze, edged with crimson; the stalks highly coloured.

D. Claudia. A fine decorative variety of small habit; leaves green, shaded on the edge with rosy-carmine. A most useful kind.

D. Earl of Derby. Leaves long and broad, ground colour bright green, broadly edged with crimson; leaf-stalks highly coloured. South Sea Islands.

D. Fraserii. This sort has very stout, broad, short leaves; the ground colour is very dark, with red variegation. A dis-



DRACÆNA GOLDIEANA

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tinct and handsome kind. South Sea Islands.

D. Frederici. A hybrid variety; dark, bronzy-green leaves, edged and veined with crimson.

D. Goldieana. A most remarkable and distinct species; the leaves are broad and pointed, greyish-green ground colour, banded across with broad irregular markings of whitish grey alternating with dark green. Tropical Africa.

D. gracilis. A small-growing kind with slender narrow leaves. A useful decorative plant.

D. Guilfoylei. Another very distinct and handsome kind; ground colour light green, striped with white, pink, and red. South Sea Islands.

D. Mrs. Bausé. A stout short-leaved variety, ground colour deep green, margined with bright crimson.

D. Princess Margaret. Different in appearance from most others, medium in growth, midrib crimson, most of the leaf-blade white, striped with pale green suffused with pink. South Sea Islands.

D. pulcherrima. A medium-growing kind, with narrow leaves; very graceful in appearance; colour green, with red and white markings. South Sea Islands.

D. Rex. A hybrid variety of distinct character; stout in habit; leaves bronzy-green, streaked and edged with carmine-red.

D. Shepherdii. One of the largest and strongest growers of the family; the leaves are very long and broad, and of different shades of green, tinged with bronzy-red. South Sea Islands.

D. superba. A small-leaved hybrid variety; leaves 12 inches long by 1 inch broad, bronzy-green, edged with red.

D. terminalis. One of the oldest, but still one of the very best for general decorative purposes, grown more than all others put together for market, as it will stand much hard usage. Leaves bronzy-green, edged and suffused with pale transparent red. East Indies.

D. terminalis alba. A form of the above with a good deal of white in the leaf marking.

INSECTS.—Thrips, red spider, and aphides can be easily kept under by syringing. Should brown scale or mealy bug attack them, sponging is the best remedy.

DRACÆNA.

(Greenhouse.)

The greenhouse kinds of Dracæna are elegant in habit, and are well adapted for conservatory decoration as also for standing in rooms, corridors, and similar places where their stately appearance is seen to the best advantage.

Such kinds as D. australis—one of the best and most generally useful—can be raised from seed, which should be sown in spring in pans filled with finely-sifted peat with a little sand added; cover the seeds lightly and stand in a temperature of 55° or 60°, keeping the soil slightly moist and shaded from the sun until the seeds vegetate, after which keep them near the glass, give more air and shade a little from the sun. They should remain in the seed pan until each plant has got several leaves 5 or 6 inches long, when move singly into 3-inch pots, now using good loam broken fine, mixed with a moderate amount of sand. As soon as the roots are fairly moving in the new soil subject the plants to greenhouse treatment, giving air freely during the day, a little shade, and water to the soil so as to keep it moderately moist; syringe overhead in the afternoons, but discontinue this in the autumn. Keep through the winter in a night temperature of 40°, regulating it in the day according to the weather. In the spring about April move them into pots from 4 to 6 inches in diameter, according to the amount of roots each plant is found to have when turned out of the old ones. After potting treat through the summer as in the previous season, again giving a little shade in the brightest weather; this summer a low pit, where they will be near the glass and can have plenty of air, will answer best. Syringe each afternoon—this is essential with this plant through the growing season in all its stages to keep down red spider, which if allowed to get established on the leaves does irreparable mischief by causing them to turn yellow and die off prematurely. All that is subsequently required is to give more pot-room as it is wanted, and to continue other matters as already advised, being careful that the roots never want moisture. Want of moisture tends to injure the lower leaves, and thus to detract much from the appearance of the plants. If well cared for this Dracæna will attain a height of 6 feet or more before the bottom leaves begin to go off. Other sorts like D. congesta, D. rubra, and D. lineata, are increased by cuttings made from both the thick extremities of the roots, and from shoots such as are produced from the old stems of plants that have had their heads removed; the young growths should be taken off when they have grown to a length of 6 or 8 inches, securing the firm woody portion of the bottom. Strip off three or four of the lower leaves, and put singly into pots large enough to hold them, drained and filled with a mixture of half loam and sand, with a little sand alone on the top. The cuttings are best put in in spring, and should be stood where they can have a temperature of 60°, where they will soon form roots, after which treat in every way as to root-room, water, air, and light, as advised for the seedlings of D. australis. Cuttings made of the old hard stems of any of these Dracænas, in lengths of about a couple of inches, will strike and make good plants, forming straight stems with handsome heads, equal in every way to the shoot cuttings. The thick fleshy ends of the roots, already mentioned, if taken off in pieces of about an inch long, and treated like the stem cuttings, will succeed equally well.

D. congesta. A slender elegant-growing kind, one of the best for using where a large grower would be inadmissible.

D. lineata. Another pretty kind that attains a medium size.

D. rubra. A handsome plant with moderately broad leaves; pale green, the extreme edges of a reddish shade.

INSECTS.—These Dracænas are liable to the attacks of red spider, but by following up the use of the syringe through the growing season little trouble may be looked for from this pest. If greenfly or thrips make their appearance fumigate with tobacco. For scale and mealy bug syringe and sponge the leaves.

DRACOPHYLLUM GRACILE.

This is a native of New Holland, and is one of the most distinct and useful plants in cultivation, either for decorative purposes in a small state, or grown on to a full-sized specimen; its colour, pure white, is not common among hardwooded greenhouse plants. It is most useful also for cutting, either for bouquets or filling vases, its thin papery flowers lasting long in water. There are few plants, excepting the Aphelexis, that retain their flowers in good condition so long, for they last well five or six weeks from the time they begin to open. No collection of hardwooded plants can be considered complete without this, particularly where they are intended for exhibition, for which it is especially adapted, both on account of its colour and its thoroughly distinct habit of growth. But to ensure the plants always being forthcoming when required, several should be grown, as it is a most delicate-rooted subject, and apt, on that account, to go off suddenly, without any apparent symptoms to indicate disease until the points of the shoots begin to flag. This is an all but certain precursor of death, except in the case of excessive dryness at the root, which never ought to be allowed to occur, as, even if it does not destroy the plant, it produces a rusty condition of the leaves which detracts much from its appearance, even if confined to the base of the plant. The leaves, being naturally very small, admit of the least imperfection in this respect being seen. It must not be understood that the only essential to secure success in its cultivation is a liberal use of the water-pot—it is one of the most impatient plants in respect to any excess of moisture at the root. It does not last in good condition so long as some, consequently it is advisable for those who grow it to each year propagate a few, so as to be in a position to make up for such as die or wear out.

While in a young state they should never be placed upon dry shelves or open trellis-work, but should be stood on some material that will hold a little moisture, such as sand or ashes, or a mixture of both. This must not be made too wet, or the pots will absorb so much water as to rot the roots; just simply keep the material a little moist, so that the atmosphere surrounding the plants may, as far as possible, approach to that which they receive when growing naturally in the open air, through the attraction of the sun acting upon the soil, which never, in the country where the plant grows, gets into that unnaturally dry condition that plants standing upon dry shelves are subject to.

This Dracophyllum strikes readily from cuttings made of the points of the young shoots, such as are to be had in quantity about the end of May. Reduce them to a length of 3 inches, put them an inch or two apart in 6-inch pots in sand, keep at an intermediate temperature covered with a propagating glass, moist and shaded, and they will strike in about two months; when well-rooted move them singly into small pots filled with fine sifted peat and sand, and continue to keep close until they begin to grow. Give just enough moisture in the soil to promote growth, and a little air in the middle of the day; shade in proportion to the state of the weather, and pinch out the points of the shoots as soon as the little plants commence to grow away. Keep through the autumn and winter at an intermediate temperature which will enable them to go on moving slowly; by the end of March move into 3-inch pots, using soil similar to that in which they were first placed, again shading as soon as the weather makes it necessary. Give more air than in the previous summer, but not so much, nor should the atmosphere be so dry, as for older stock ; a slight syringing overhead may be given at shutting up time in the afternoons. Again stop the shoots when they begin to move freely, and treat as in the preceding summer with the exception of now continuing to give more air. Look closely to the plants every day to see what water is required, and never give any until the soil is dry enough to need it. Continue this till August, when give more air, keeping cooler through the autumn, and winter at about 45° in the night. In the spring towards the end of March repot in the best fibrous peat, to which add one-seventh of sand ; pot firm and give a 2 or 3 inch shift, which will be sufficient, as there are few plants that require less root-room. Keep them a little close until they take to the new soil, and be careful in the use of water. Cut the shoots back to within 4 or 5 inches of where they were stopped the last time ; treat through the summer, autumn, and winter as before. About the same time in the spring give pots 2 inches larger. Towards the end of April the flowers will be fast pushing up. At the base of the flower-stalk, about 6 or 8 inches below the flowers, a number of buds will be found—the shoots the plant is pushing for another year. If these are allowed to go on the plant will get thin and straggling, consequently after blooming the shoots should be cut back half-way between these buds, and where the last year's shoots spring from ; this will keep them in a sufficiently compact state. Treat through the summer as advised for the preceding, and winter similarly as to light and water. A temperature of about 40° will now be sufficient ; the following spring they will flower from every point. After the blooming is over cut back as advised last year ; do not allow the shoots to remain at greater length, and when they have fairly broken again give a 2 or 3 inch shift. When they have reached this size it is better not to re-pot until after flowering, as they will now be very useful for general decoration. Through the summer and autumn treat as heretofore, and winter as previously advised. After they have bloomed the following year shorten the shoots as before, and give a 2 or 3 inch shift, which in most cases will be as large as ever found necessary for this plant, for afterwards sufficient strength can be kept up by giving weak manure-water once a fortnight through the growing season.

This Dracophyllum is better never turned out in the open air ; it is not subject to mildew, consequently requires no hardening, and it is naturally such a free flowerer that it needs no exposure in this way to ripen the growth.

We have said nothing so far respecting training the plant. Each time it is potted insert as many sticks in the new soil as are requisite to support and keep the outer extremity in shape ; by this means the least possible injury will be done to the roots, and as the centre of the plant requires the sticks to be replaced, put the new ones in the holes the old ones have occupied : so managed little injury will be done. The plant is a thin, wiry, weak grower, requiring to be well supported ; the sticks should always be somewhat thinner than requisite for things of a stronger habit of growth, and no more supports than are absolutely necessary should be used. In the training of this plant we frequently see so many sticks employed as to make them much the most prominent feature, which is most objectionable, and only exceeded in ugliness by placing it, as is sometimes done, on a wire trellis.

INSECTS.—There are few plants so little subject to the attacks of insects ; if brown scale appear they increase so slowly on it that they are easily kept down by the occasional use of a small brush or sponge.

DROSERA.

These are very interesting plants ; the British species, popularly called by the name of Sundews, are well known. The exotic kinds that require a warm greenhouse or cool stove to do them justice are much larger growers than the native species. They should have plenty of light and moisture, and do best in living sphagnum with some fibrous peat and potsherds added ; the material should be kept constantly wet almost to saturation.

They are easily propagated from seeds, which should be sown in a mixture of finely-chopped sphagnum and peat, to which add a little sand. Press the material firm, and scatter the seeds on the surface, having first settled it well with water ; afterwards stand the pots in a pan of water, by which means little will be required to be applied on the surface. Place the pots in a moderate stove heat ; as soon as the seedlings are large enough to handle put them singly in small pots, and treat in the matter of water and warmth as already advised. Give a little shade in bright weather during summer, with plenty of light. All that is requisite further is to give larger pots as this becomes necessary, being careful not to disturb the roots in the operation of potting, as the plants are impatient of injury in this way.

D. capensis. A pretty kind, with longish leaves. It comes from the Cape of Good Hope.

D. dichotoma rubra. A handsome kind, with deeply-forked leaves, from the surface of which spring a quantity of red hairs.

D. filiformis. A medium-sized species, with pretty erect leaves, fully furnished with the red hair-like glands. Introduced from North America.

D. spathulata. This a closer-growing plant than the preceding, with a distinct habit. A desirable kind; from Tasmania.

DRYNARIA.

A handsome genus of stove Ferns, distinct in appearance. The singular massive fronds which many of the kinds produce, offer a marked contrast to those of the more elegant species.

For propagation and cultivation, see Ferns, general details of culture.

D. coronans. East Indies.

D. musæfolia. Malay Islands.

D. quercifolia. East Indies.

DYCKIA ARGENTEA.

A curious-looking, low-growing stove plant, with long, narrow leaves that lay as flat as those of Tillandsia argentea; the leaves are coated over with a similar greyish-white covering. Its principal attraction consists in the singular way in which the leaves are disposed. It belongs to the Bromelaceous order, and requires similar treatment to Billbergias, which see. Introduced from Central America.

ECHEVERIA.

Evergreen succulents, several kinds of which have been much used for planting out-of-doors in summer since carpet bedding came into fashion. Beyond their adaptability for this purpose, there are some that deserve a place amongst the occupants of the greenhouse.

They are easily increased by cuttings made of the crowns, or off-sets which most of the sorts produce annually; these should be taken off in spring, allowed to lie on the potting bench for a few days so that their succulent fleshy stems have time to dry up a little, and should then be put singly in small pots filled with a mixture of half sand and loam in a slightly moist condition. Stand them in a temperature of 55° or 60°, but not in the usual way under a propagating glass, as if confined they will most likely rot. They will soon strike; when the little pots are full of roots move into others a size or two larger, and give them a light position in a greenhouse or pit fully exposed to the sun, in which they delight. Some of the kinds, such as E. metallica, which is a strong grower, may require more room before the end of summer, in which case it should be given, but none of the sorts like overpotting. They require plenty of air, and should have a dry atmosphere. Their flowers are very enduring and are distinct in appearance. They will also strike freely from cuttings made of the stems. Cut them in lengths with three or four eyes each, and treat as advised with the suckers.

The following are desirable kinds:—

E. agavoides. Flowers scarlet.

E. atropurpurea. A pretty distinct-looking species.

E. metallica. A handsome species, worth growing for the distinct metallic colour of its leaves.

E. metallica glauca. A glaucous-leaved form of the last named.

E. pulverulenta. A handsome species; the flowers a combination of red, white, and green. Mexico.

E. retusa. A compact-growing kind, with pretty red and yellow flowers; blooms in summer and autumn. Mexico.

E. retusa glauca. A distinct form of E. retusa.

E. secunda. A pretty plant with scarlet flowers. Mexico.

INSECTS.—Few insects molest Echeverias except aphides, which sometimes attack the flower-buds; the remedy is fumigation.

ELÆIS GUINEENSIS.

A stove Palm, not equal in appearance to many others, but interesting from its being the plant from which the Palm oil of commerce is obtained. From Africa.

The method of propagation and after management will be found under Palms, general details of culture.

ELAPHOGLOSSUM.

This genus of stove Ferns, which is nearly allied to Acrostichum, contains several species that are sufficiently distinct in appearance to make them worth including in even a select collection.

For propagation and cultivation, see Ferns, general details of culture.

The undermentioned are well-marked kinds:—

E. L'Herminierii. Trinidad.
E. rigidum.
E. squamosum. West Indies.
E. viscosum. West Indies.

EMBOTHRIUM COCCINEUM.

An evergreen shrub from New Holland, that bears red flowers. It is not much grown at the present day, being inferior to the generality of plants requiring the warmth and protection of a greenhouse. It is the only species of the genus worth cultivating. The flowers are produced in spring, and it requires treatment similar to the Correas, which see.

ENCEPHALARTOS.

Stately, large-growing evergreen plants of the Cycadaceous Order. They form stems similar to Cycas circinalis, but thicker, but this development is slow, and it takes years to get a trunk of much length. The leaves are remarkably hard in texture. They will bear keeping all the year round in a cool greenhouse, but so treated they usually stand for years without making new leaves, the result being that the older ones, dying off, by degrees much reduce the size of the head; consequently they should be kept in the stove during the growing season, and until their young leaves are fully matured. Their treatment is similar to that advised for the warm section of Cycas, which see.

The undermentioned are fine and distinct kinds :—

E. Caffra. A distinct species, with handsome foliage. A native of the Cape of Good Hope.

E. Hildebrandtii. This is a fine kind; the leaves have moderately stout spines on the edges. From Africa.

E. horridus. A stout-leaved sort, the leaves armed with formidable spines. Cape of Good Hope.

E. villosus. A noble species with very long leaves. Africa.

E. villosus ampliatus. A handsome kind, with long, arched, pinnate leaves. Africa.

E. Vroomii. One of the finest of the family; the leaves are moderately long and arched, the whole plant assuming a beautiful vase-like form. Africa.

ENCHOLIRION CORALLINUM.

This is a stove plant, and is similar in habit to many of the Bromeliads, to which it is nearly allied. The leaves are recurved, green above, purple beneath. The flowers are yellow with red bracts. It requires similar treatment to Billbergias, which see. It comes from Brazil.

ENKYANTHUS.

These are evergreen shrubs that grow to a moderate size; they are effective plants when in flower, but are now seldom met with.

They require similar treatment to Hedaromas, which see. The cuttings should consist of the mature shoots, such as advised for Hedaromas.

The two undermentioned are, we believe, the only kinds in cultivation :—

E. quinqueflorus. Bears pink flowers, produced in summer. A native of China.

E. reticulatus. A Chinese species, with pink flowers, which open in winter.

EPACRIS.

These evergreen greenhouse plants, natives of New South Wales and New Holland, are profuse bloomers, lasting in flower for a considerable time. Some varieties are naturally disposed to bloom in the winter, others in the spring, which gives them a wider range of flowering time than most plants. They are also comparatively easy to grow, being stronger rooting plants than many hardwooded subjects. Their colours range from white to dark crimson; others, with a combination of red and white or pink and white, are very attractive on the home or exhibition stage, either of which they are well adapted for, being quite distinct in their general habit, the flowers hanging in graceful plumes from their slender shoots, and giving a well-bloomed plant an elegance of appearance surpassed by few others. They also possess the advantage of standing a moderate amount of fire-heat when being brought into flower, and they can be cut freely without doing further injury than so far reducing their size, which, for some purposes, is rather an advantage than otherwise. Their flowers, when cut, especially in the winter time, remain a long while fresh in wet sand or water. They are also plants that are much less subject to insects than most others. These qualities make them most desirable, either in a large or most select collection.

Epacrises strike readily from cuttings made of the young half-ripened shoots about 2 inches long, put in about August several together in 6 or 7 inch pots in sand, kept close, moist, and shaded; so managed they will root during the autumn. Keep in the cutting pots through the winter in a night temperature of 50° or near this, pinching out the points of the shoots as soon as there is a disposition to grow. In March move singly into small pots, and encourage them by a genial temperature and a moderately close atmosphere until they have begun to grow. Then give more air and dispense with shading except when the house or pit they are in is so light as to dry up too quickly the little pots that these and similar young stock at this stage occupy. Syringe through the spring and summer each afternoon when the house is closed, stop the shoots again about the end of June. By the middle of August give more air, and cease syringing; keep through the winter at a temperature of 40° in the night. Towards April move into pots 2 or 3 inches larger, and treat as before, stopping the shoots in May and tying then well out at the same time. During the remainder of the season and also the ensuing winter they will require managing as previously; move again in spring to pots 2 or 3 inches larger, according to the strength of the plants and the condition of their roots.

Good fibrous peat, without anything added except clean sand, in sufficient quantity to ensure porosity, is all that is required—this will grow them better, and the plants will last longer in it than in a mixture of loam and peat, or all loam, such as they are sometimes grown in. Make the new soil quite as solid in the pots as the ball of the plant is, and at once remove them to a house or pit, where they can be kept a little close, and slightly shaded from the sun for a fortnight; then gradually dispense with shading, as plants from such sunny climes require all the solar light we can give them after they have attained this size. Train the shoots right out horizontally, drawing them down to the rim of the pot: if the future groundwork of the plants is not laid in this way they soon get naked and leggy at the bottom; close early in the afternoons, drawing the syringe over them at the same time. The strongest growers should have their shoots stopped once during the summer; gradually inure them to more air, so as to ripen the wood before the autumn is far advanced. It will not be necessary to expose them to the open air this year, as the object is not so much to prepare the plants for flowering as to get a maximum of growth.

Through the autumn and winter they must be watered with care; it is necessary at all seasons, even when the plants are growing freely, to see that they are never overwatered, that is, watered before the soil is sufficiently dry to require it; there are few plants that are so easily killed by any mistake in this matter, and we have no doubt this is the reason they are not grown in anything like the quantities they deserve to be, especially for conservatory decoration, and for producing cut flowers in the winter. In the summer, while the young growth is soft and tender, if water is withheld until the points of the shoots flag slightly, no injury will follow. We simply instance this to show that, with Epacrises, it is much safer to withhold water a little too long than to give it too soon. The winter-flowering varieties have mostly an upright habit of growth, and about Christmas should have their shoots shortened to within 6 inches of the point to which they were cut back the previous year, unless it is deemed advisable to flower them this season. This will cause a considerable sacrifice in the coming summer's growth, nevertheless it will not injure the plants in any other respect: and if their flowers are wanted, the plants should in January be placed in a little warmth—45° to 50° in the night, with 5° additional by day, which will bring them on nicely. After flowering, cut the shoots back as far as already directed, and if the plants are kept in a similar temperature to that in which they were brought into flower they will break quickly, after which they must be potted, and allowed about 3 inches more room.

Those plants that were cut back without allowing them to flower, must also when they have made a couple of inches of growth (which will be towards the end of April) be potted, after which they should be treated as in the preceding year. The spring-flowering varieties, of which we may take E. miniata as the type, should be shortened back at the same time as the winter-flowering section; they do not need cutting in so close as the upright growers, but, in other respects, they require to be treated in the same way. Through the spring and summer manage as before; encourage them to make strong and free growth by giving them a good light house or pit, using, as in the preceding summer, the syringe every afternoon, at the same time closing the lights. Towards the beginning of July gradually inure them to more air, and by the end of the month they will be in a condition for turning out-of-doors, on a good bed of ashes to exclude worms. At first place them on the north side of a wall, fence, or tree, where they will receive a little shade from the midday sun; afterwards they may be gradually inured to bear it fully. They may remain here until the middle of September, later than which it is not advisable to risk them out for fear of frost.

During the time they are in the open air they must not be suffered to get too wet at the roots; to prevent this the plants should be laid on their sides when heavy rain seems likely to occur. Keep them regularly trained out during all stages of their growth: they are peculiarly easy to keep in order in this respect, from the flexible nature of their shoots, which will bend readily in any direction. Winter and treat generally as before such as are required for early flowering, as to bringing them into bloom and also when done flowering. These early-flowering plants should be potted as before directed, when they have commenced growth; even at this size they will not require more than a 3-inch shift. The later varieties that bloom in May or June had better not be potted until they have flowered and commenced to grow; treat them as before, with additional shade and moisture in the atmosphere, consequent upon the greater amount of sun-heat at this advanced season. The plants will not require potting after this oftener than once in two or three years, or they may remain even longer if assisted with weak transparent manure-water during the time they make their growth; plants so treated may be kept by this means in a good healthy condition without additional pot-room for six or seven years.

For winter and early spring flowering the following varieties will be found good in colour and constitution, and generally useful either for cutting or conservatory decoration:—

E. hyacinthina candidissima. White.
E. hyacinthina carminata. Carmine.
E. hyacinthina fulgens. Bright pink.
E. Kinghornii.
E. Lady Panmure. White, tinged with rose.
E. Mont Blanc. White.
E. Mrs. Pym.
E. Salmonea. Reddish salmon.
E. Sunset. Bright red.
E. The Bride. Pearly white.
E. Vesuvius. Crimson.

For late blooming, especially when required for exhibition, the undermentioned more bushy-habited varieties will be found the best:—

E. Eclipse. Bright red, mouth of the tube heavily tipped with pure white; an excellent strong-growing variety.

E. grandiflora rubra. Fine and strong, rather deeper in colour than the preceding.

E. miniata. Red, tipped with white.

E. miniate splendens. Red tipped with white.

Insects.—Epacrises are rarely affected with mildew, and are seldom attacked by insects, except scale. The brown species can easily be destroyed by a dressing of insecticide used strong enough to kill them and applied when there is no growth going on and the flowers are not far enough advanced to be injured thereby. White scale on these, as on other plants, is difficult to kill, and sometimes a stronger application is necessary to destroy the insects than the plants will well bear. The tender young growing points of the shoots are sometimes affected with aphides, but these are easily destroyed by fumigation.

EPIPHYLLUM.

As decorative plants during winter and spring the different varieties of E. truncatum have few equals. They bloom well even in a small state, and can consequently be used either in 5 or 6 inch pots for the decoration of the side stages in a stove or intermediate house, or they can be grown to a size sufficiently large to fit them for a central position in large plant structures. In no way, however, are they seen to better advantage than when grown on their own roots in the form of low spreading bushes 12 or 15 inches in diameter, plunged in neat wire baskets of suitable size, fringed with Lycopodium cæsium or other Club Mosses, suspended from the roof of the house in which they are placed. In this way their drooping flowers are shown off in the best manner. Showy flowering plants with a drooping habit are not over plentiful, and it is well to use these Epiphyllums in that way. If hanging baskets were employed to a greater extent than they usually are, the appearance of plant houses, both warm and cool, would be enhanced. Epiphyllums of this class are easily propagated either by grafting on the Pereskia stock, or by striking cuttings for growing on their own roots.

Cuttings made from pieces of the shoots, consisting of three, four, or half-a-dozen joints, taken off before growth has commenced, and inserted singly in small pots, drained and filled with a mixture of equal parts of sand and peat or sand and loam, will strike root freely if placed in a brisk heat and slightly but not over-moistened. They should be kept moderately near the light, but not under a propagating glass or similar contrivance, as if confined they are liable to rot. When the pots are filled with roots, shift into others a size or two larger, but they must never be over-potted. A mixture of five parts turfy loam to one of sand, with a sprinkling of potsherds, will be found to suit them perfectly. Soil of an adhesive character, that will hold too much moisture, they cannot bear. Grow them on in an ordinary stove temperature without shade during summer, and pinch the points out of any shoots that too much outgrow the others. A temperature of 50° in winter will be sufficient for them, and they should be kept drier at the root than when in active growth. In spring increase the pot-room according to the progress which the roots have made, and grow them on until the end of July, as in the preceding season; then turn them out for a month under a south wall, where they will be exposed to the full influence of the sun. In cold parts of the country, where this cannot be done, instead of turning them out-of-doors let them occupy a dry shelf in a greenhouse, or an equally airy light position in a pit or frame, and they should have less water given to the roots than while in active growth. Epiphyllums of the truncatum class, being orginally from Brazil, will bear a high temperature, and their progress, other cultural details being equal, will usually be more or less in keeping with the amount of heat to which they are subjected. They are generally grown as standards, so as to form either a drooping pyramidal head, or as spreading umbrella-shaped plants. Their cultural requirements when grafted on the Pereskia stock are similar to those under which they succeed on their own roots; but on this stock they will frequently bear a little rougher treatment. The Pereskia stocks on which to grow them are easily struck from cuttings put in in spring, and subsequently treated in a similar way to the generality of the Cactus family, with the exception that they do not like such a continuous dry condition of the roots as some succulents will bear. The grafting may be effected any time either in the spring or early in summer. All that is required is to remove the top of the Pereskia, shortening its stem according to the length of leg wanted, then cleave it at the top in a way similar to that practised in ordinary cleft grafting; pare down the Epiphyllum scion at the bottom into the form of a wedge, slip it into the cleft in the stock, and bind it moderately firm, so as to hold it in its place, and nothing else is needed. Plants thus treated and placed in the temperature of an ordinary stove, will unite in a short time, after which the management ought to be the same as that for plants propagated from cuttings.

The following are good varieties:—

E. truncatum albo-violaceum.
E. truncatum bicolor.
E. truncatum Bridgesii.
E. truncatum Ruckerii.
E. truncatum salmoneum.
E. truncatum salmoneum marginatum.
E. truncatum splendens.
E. truncatum violaceum grandiflorum.
E. truncatum violaceum Snowii.
E. truncatum violaceum superbum.

The stronger and more erect-growing Epiphyllums now generally known under the name of Phyllocactus, are easily propagated by means of cuttings treated in accordance with the directions given for striking the truncatum section; their after management, both as to growth and preparation for flowering, is also similar.

The undermentioned are handsome and desirable kinds:—

E. Ackermannii. A medium-growing Mexican sort, with scarlet flowers.

E. alatum. A fine North American white-flowered species, distinct and handsome.

E. crenatum. A distinct-habited sort, with conspicuous white flowers, from Honduras.

E. latifrons. A South American kind, that differs in appearance from most of the others; its flowers are creamy yellow.

E. speciosum. A strong-growing Brazilian kind, bearing large highly-coloured red flowers.

E. speciosum Jenkinsonii. A very free-flowering handsome hybrid, with crimson flowers.

INSECTS.—Epiphyllums are little troubled with insects except greenfly, which often establishes itself on the flower-buds, and is best destroyed by means of fumigation.

ERANTHEMUM.

Amongst the freest growing and most easily managed occupants of the stove are certainly the Eranthemums. They are alike suitable for large or small houses, as they bloom in a very small state, or they may be grown to a considerable size. They propagate easily from cuttings put in at any time of the year when half-ripened shoots can be had, but spring, about the end of March, is the best time to strike them; they will root in two or three weeks in sand, kept close, warm, and moist. After they are well rooted move them singly into 6-inch pots in ordinary loam with a little rotten manure, leaf-mould, and sand, pinching out the points. They will thrive under such conditions of heat, atmospheric moisture, and air as the generality of stove plants that are grown annually for winter flowering succeed with—that is, plenty of light, a little shade when very hot, with air in the middle of the day, and syringing when the air is taken off. They are quick growers and mostly gross feeders. By the beginning of July they will require another shift into pots proportionate to the strength and size the different kinds naturally acquire. Strong growers, like E. pulchellum and E. cinnabarinum, will bear a second shift into 8 or 10 inch pots; weaker-growing sorts, such as E. aspersum and E. Andersonii, will do with 7 or 8 inch pots. Attend to stopping, or most of the kinds, being erect-habited plants, will run up thin and insufficiently furnished. Encourage growth, and when the roots have got fairly hold of the soil after the last shift use manure-water. An ordinary pit where the plants can stand close to the glass will answer best for them during the summer months. The different species bloom at different periods through the late summer, autumn, and winter, but by stopping the shoots of the earliest flowerers later in the season they may be made to bloom later, when their flowers will generally be of most use. In September keep the atmosphere drier, cease shading, and give more air so as to harden up the growth. As the weather gets colder see that enough heat is given to prevent their getting chilled, which would seriously affect their flowering. A temperature of 60° in the night, with an increase by day, will answer in the later months of the year, and so on for a time afterwards. When coming into bloom stand them close to the glass, which will give much more substance to the flowers, and cause them to last longer. When the blooming is over the plants may be headed back and kept slightly moving until March, when those that are to be retained for another season's flowering should be turned out of their pots, have their balls reduced, and be re-potted in fresh soil, and at the same time cuttings of such as it is deemed advisable to increase should be struck. Small or medium-sized examples will in most cases be the most desirable.

All the following are well worth growing:—

E. Andersonii. A lovely kind, ground colour of flowers white, spotted with crimson; gives a good succession of bloom. India.

E. aspersum. A very fine growing beautiful species, with white flowers spotted with purple, and a conspicuous purple spot on the lower lobe. Solomon Islands.

E. cinnabarinum. A tall-growing sort, that bears beautiful red flowers with a crimson blotch on the bottom lobe. Martaban.

E. laxiflorum. A dwarf-habited sort. with compact foliage, and one which produces a profusion of purple flowers. Fiji.

E. pulchellum. A well-known, most useful winter-blooming kind, with lovely blue flowers produced from every bit of growth. A native of India.

E. sanguinolentum. A handsome variegated-leaved species from Madagascar.

E. strictum. A large blue-flowered kind from Nepaul.

INSECTS.—Eranthemums are not so much subject to insects as many plants that require stove heat. Red spider and aphides sometimes make their appearance; syringe freely with clean water for the former, and fumigate with some one of the tobacco preparations for the aphides.

ERICA.

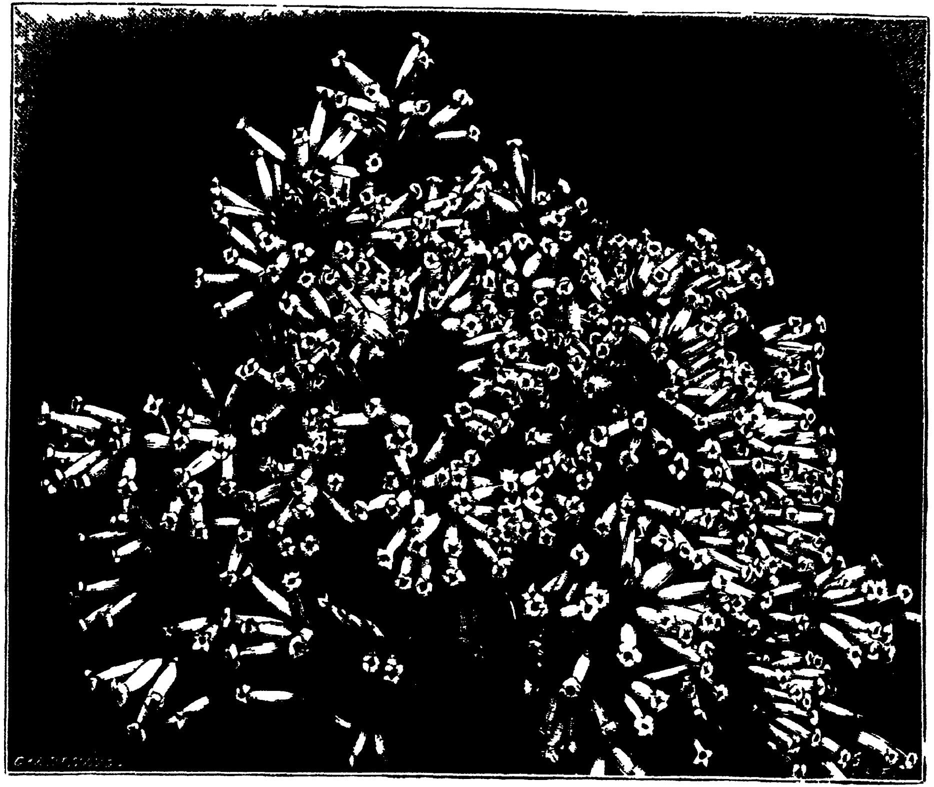
Ericas belong to a very numerous family of evergreen greenhouse hardwooded plants, indigenous to the Cape of Good Hope, many of those that have been introduced no doubt being natural hybrids, from the seeds of which have been raised in this country numbers of the finest varieties in cultivation. In fact no plants have rewarded the patient manipulation of the hybridist better than these—patient, we repeat, for those who essay the raising of new varieties of Heaths need to exercise the virtue of patience to an extent not required by those who confine their operations to plants of a more precocious nature. The most successful raisers of Heaths assert, and no doubt correctly, that it takes ten years to raise a variety from seed and propagate enough stock of it for letting out, as the greater portion, especially the hardest-wooded kinds, are slow growers, alike from the seed-pan or the cutting-pot.

As decorative plants Heaths stand second to none in cultivation, although in their individual blossoms they cannot lay claim to the gorgeous character possessed by many plants; but the simple beauty of their flowers and the profusion in which they are produced, added to their wax-like substance and charming tints—ranging from pearly white all through the shades of blush and pale pink to red and the deepest crimson—render them unsurpassed. Their time of blooming varies in the different kinds so much that if even a limited selection is grown they can be had in flower almost the whole year round. Like many other fine families of plants they have at some times been more fashionable than at others, now and again giving place to things that need less attention and are of quicker growth. Nor is this to be wondered at, for they are by no means the subjects to be taken in hand by inattentive cultivators, or those who attempt to make plants collectively conform to some general course of treatment. Those who undertake to grow Heaths should in all cases realise the fact that they will not submit to a give-and-take sort of treatment, by paying them double attention to-morrow or next week, because their wants were neglected yesterday or the week before. Unless they continually receive the attention they need it is of no use attempting to grow them. We do not know of any plants better calculated to induce in a young gardener the habits of observation, with continuous care and attention, essential to general success in the pursuit. The raising of seedling Heaths is an interesting operation, but, except in the case of those who are disposed to go into the work in earnest, it is better left undone.

The soil for Heaths should be good peat, varying according to the requirements of the particular varieties. The freest-growing kinds ought to have it somewhat softer, containing more fibre than the hardest-wooded, slowest-growing sorts; the latter also require more sand mixed with the soil than the stronger growers; and if crocks, broken to about the size of small horse beans, are added, these will contribute to keep the soil in a sufficiently open, porous condition. It must be borne in mind that the whole family cannot exist if their roots are placed in material that is at all of a retentive nature; it must be such that the water can pass freely through, and as the plants would not bear the shaking out and the soil-renewing which is practised with many things of a strong-rooted character, it follows that the material used to grow them in should be such as will maintain its porosity as long as they live, and as Heaths frequently maintain a healthy vigorous condition for a score of years or more, it will be evident that more than ordinary attention should be paid to the selection and preparation of the soil in which they are grown.

Their propagation is effected by means of cuttings made of the points of the young shoots, such as are obtainable in the case of most kinds in the latter part of the summer. These should be closely inserted in 5 or 6 inch pots filled with a mixture of finely-sifted peat and sand, the surface being all sand; the cuttings must be kept moist, closely covered with propagating glasses, shaded, and placed in an intermediate house or pit until well rooted, which will be before spring. Dispense with the glasses as soon as sufficient roots exist to support the young plants. By March they should be in a state for potting off; put them singly in small pots, well drained—a condition of vital importance in all stages of the existence of Heaths, without which disease, or more frequently actual death, is certain to overtake them. For this first potting the material should consist of finely-sifted peat with a liberal addition of sharp, clean sand, and pressed firm in the pots. Care should be taken that the soil is fairly moist when the plants are put in it, so as to avoid the necessity for giving water as long as possible until the roots have begun to act; it should not, however, be too wet, as if it contains over much moisture it becomes a compact mass, in which the roots never ramify freely, and the result is that an unhealthy condition of the plants usually follows. Never give water to a Heath immediately after a shift by way of settling the new soil about its roots, as sometimes recommended in the case of newly-potted plants of various kinds; such a proceeding is not unlikely to destroy the delicate points which, to some extent, undoubtedly get more or less bruised in the removal, although the injury is not apparent to the ordinary observer. The young stock should be put in a light position, near the side of the house or pit which they occupy. Avoid standing them on dry bare shelves, as is sometimes practised, as these help to dry up quickly the small amount of soil which the little pots contain. In place of this set them on a stage, covered with an inch or two of sand or fine ashes, which, being kept slightly moist, will render frequent watering less necessary, and also prevent their getting too dry.

When well established, Heaths are air-loving subjects, requiring more than most plants, but until the young stock get fairly into growth they must not have too much given them; for this reason they must be kept a little close until they begin to move freely, and as the sun gets powerful it may be necessary to afford them a thin shade. As soon as they commence to grow pinch out the points of the shoots, so as to ensure their branching-out low enough, without which it is impossible to have them well furnished at bottom. The size attained during the first summer will depend on the varieties; softwooded quick-growing kinds, like the winter-flowering E. hyemalis, and others of that class, make much more progress than the hardwooded kinds, and amongst these even there is a wide difference in the rate of growth. As the season advances give more air, and allow some to remain on in the night in summer; during



Erica Ventricosa

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dry hot weather the stock should be looked over as to water twice a day. Keep them well up to the glass in order to secure stout well-matured growth, giving plenty of air, but not subjecting them to keen draughts. Through the autumn and winter let them have a light position where they can be kept a few degrees above freezing. During the dormant season let the atmosphere be dry, and now, as at all other times, never give water until the soil is so dry that withholding it longer would be likely to cause injury. Again early in spring they must be potted—3-inch pots will be the right size; this time break the peat fine by hand in place of sifting it, and add sand as before. The strongest shoots must have their points pinched out, with a view to still further induce the formation of branches. Treat as during the last summer in respect to air, water, and general routine, continuing to keep them well up to the glass. A low light span-roofed pit is well suited to the requirements of Heaths, especially in their early stages, as in such a structure they can easily be kept close to the light, and in hot weather the air is not so dry as to have a parching effect on young plants before they get into pots holding a larger body of soil. In summer during very hot weather it will be an advantage to moisten the floor of the pit, which will correct the over-dry state of the air, for although Heaths do not like a damp, stagnant atmosphere in autumn and winter, nor are they improved by the application of water overhead, it may under glass be drier than is good for them. Treat through the winter as before, and again give them a shift early in spring into pots 1 or 2 inches larger, according to the more or less free-growing nature of the variety; use the soil now in a less finely broken condition than previously, and at each subsequent potting as the plants get larger, it should be used in a still more lumpy state

The advantage of potting Heaths, especially while small, early enough before the external air has got hot and dry, is that there is less likelihood of their suffering through the effects of removal than if the operation is deferred until later on. Again pinch out the points of all the strong shoots, and in addition to this the strongest must be tied out horizontally close down to the rims of the pots. This has the double advantage of throwing the strength into the weaker growth left in an erect position, and of ensuring the dense bushy habit that is natural to Heaths generally, and which they would assume without assistance if growing in the open air. Treat through the summer and subsequent winter as before, and again in spring give more root-room. The additional size of pots given should be regulated by the strength of the plants and the more or less vigorous habit of the variety. It is well to avoid the extreme of too much pot-room, or the opposite of too little. At this stage pots an inch larger for the slow growers will be sufficient, while the freest will bear a 2-inch shift. This season a few small sticks will be requisite to tie the strongest shoots to so as to keep the plants to the desired shape, but now, and in all subsequent stages, do not use more supports than cannot be dispensed with, as the act of thrusting sticks into the soil has the inevitable effect of destroying more or less of the roots, and the use of more than is required directly tends to destroy the appearance which the plants should have either in or out of flower. This year, towards the close of the summer, they will be all the better for having the lights drawn off them in fine weather, by which means their growth will get matured—a condition still more necessary in after years as the plants acquire more size. Let the winter management be as previously, and in spring give more root-room; young plants in, say, 6 or 7 inch pots will bear a 2-inch move, more or less according to the free or slow growing nature of the variety. Do not on any account disturb the roots more than unavoidable; disentangling them from the old ball must by no means be attempted. Drain the pots well, using some of the fibrous pieces of the soil to cover the crocks. An old practice in the potting of Heaths was to elevate the balls so high in the pots that little room was left for water; this was done with a view to keep the collar of the plants sufficiently dry, which is essential, but it can be effected equally well by keeping it somewhat higher than the rest of the surface of the ball, leaving this sloping gradually from the centre to within a little distance of the sides of the pot; by this means the whole can be kept enough below the rim of the pot to allow proper space for watering. Three quarters of an inch is not too much for plants in 8 or 9 inch pots. Studiously avoid light potting; in all cases ram the new soil so as to make it as close as that contained in the old ball. If this is not done, water, when given afterwards, will pass down the sides through the new material, leaving the centre in which the roots exist so dry as to cause death or disease.

After potting keep the house a little closer than usual for a few weeks, giving no side air; and, if the weather is bright and dry, sprinkle the surface on which they stand so as to counteract the loss of moisture from the leaves given off by evaporation. It may be well to state here that although they are essentially air-loving plants, and are able to bear a freer admission in direct contact with them than the generality of the subjects grown in greenhouses, side air during the time the cutting March winds are blowing should be admitted to the house with caution—even to such as do not receive a shift at this time. If care is not taken the leaves will most likely be injured so as to become of an unhealthy bronzy colour, from which they rarely recover, dying and falling off before their allotted time, and this, as a matter of course, is alike detrimental to the health and appearance of the plant. As soon as they are potted all the stronger branches should again be bent well down in a horizontal position; if this is not attended to while the plants are young the omission can never afterwards be remedied, as the shoots of many sorts get too strong to bend, and the requisite outline cannot be preserved, as the strong growths, even if repeatedly stopped, have such a tendency to take the lead in an upright direction that the weaker branches are starved and ultimately die off, leaving the plants naked and unsightly at the base; for this there is no remedy, as few Heaths will bear cutting back far into the old wood. Whatever stopping is required in the shoots should be done at this stage, as the object with this young stock is the laying of a foundation of future shapely specimens rather than any bloom they make this season. In a few weeks the roots will have begun to enter the new soil, when more air may be given. Each plant must now be daily looked over so as to ascertain if it requires water, and this should be continued all through the summer; many fail to grow these plants satisfactorily through erroneous impressions entertained as to the water they need. It is generally understood that if a Heath flags through want of water death is likely to follow, and from this impression those in charge are often induced to give water before it is absolutely needed. This is equally certain to bring about an unhealthy state, fatal in its consequences. Taking the family collectively they require the soil to get drier before water is applied than other plants, and the harder-wooded and slower-growing the variety the more necessary is it to treat in this way. But in all cases when water is given enough should be applied to moisten the whole of the soil, but not to saturate it, as the roots, from their extremely fine delicate nature, cannot bear any excess. As a matter of course the more vigorous the condition the more necessary is it to see they do not get too dry before watering. The same holds good in the case of the softest free-growing kinds, and with all, the soil during the summer season should never be allowed to get so dry as in the winter when comparatively little growth is in progress.

Through the summer the stage on which they stand should be freely sprinkled with the syringe daily; the plants themselves should not be syringed, for although this promotes growth, it makes them so soft as to render them more liable to the attacks of mildew. Nor should they now be shaded in sunny weather, as the effect would be similar. They should be kept under glass until the beginning of August, at which time they ought to be stood out in the open air on a bed of ashes sufficiently thick to exclude worms; let them stand close enough so that each plant may screen the pot of the one behind it from the sun during the middle of the day. The direct action of the sun on the pots has the effect of injuring the roots that, in a healthy plant, lay in quantities against the inner surface. Should there be an appearance of drenching rains, lay them down on their sides. Take them in about the middle of September, for if left out until the nights are frosty the young growth will suffer. Winter as before in a light airy situation, attending to their wants as previously. If all has gone well they will need more root-room the following spring; give a 3 or 4 inch shift in the case of those with plenty of roots, and less to such as are not so strong. Most of the plants will flower during the spring, summer, or autumn, according to their season of blooming, and will make nice decorative objects; but if used in this way they must not be put in dark houses or crowded among other plants, or they will suffer thereby. Where it is deemed more desirable to grow them quickly to a larger size, it will be well to pinch out the points of the shoots about the beginning of February; this will cause them to break out bushy, to further assist which tie out the strongest shoots as advised in the spring previous. Treat through the summer and the following winter as previously. They will by this have formed nice compact plants, and should be let to bloom, after which the freest-growing kinds ought to have their last summer's shoots shortened back to about two thirds of their length; but all the slowest growers should merely have their flowers picked off as soon as they have faded—do not allow these to remain on to form seed, as that has a weakening influence. They should be treated in this way all through their existence, for, if left to seed they will flower later the ensuing year, and the quality and strength of their blooms will be reduced. Staking and tying should be carried out each winter, when the plants are most at rest. Use no more sticks than are necessary to hold them in their proper position; the weakest wooded varieties will need the most support. When the plants are wanted only for home decoration fewer sticks will suffice than when they have to be moved about considerable distances for exhibition.

The subsequent treatment year after year will be much of a routine character, in accordance with the directions already given; use the potting soil in a more lumpy state as the plants get bigger, and always let them have enough root-room as they require it, for if allowed to become pot-bound they will be liable to die when shifted. As the specimens get old, and in pots as large as deemed desirable, they may with advantage be assisted with weak manure-water during the spring and summer; and when they occupy pots of considerable size it will be necessary at the time they are turned out to harden in the summer to put a piece of old mat or canvas round the pots so as to break the force of the sun.

We have tried the potting of Heaths at different times of the year, and found that an early time—from the latter end of February to the middle of March—is the best for young stock, and September for older specimens. The hot summer months, when shoot-growth has commenced after flowering, is the worst possible season that can be chosen for moving large Heaths, as then the solar heat is so great that to keep down the temperature it is necessary to admit a considerable quantity of air to the house in which they are placed, and this quickly dries up the soil so as to make the application of water requisite sooner after potting than it should be given with a view to the well-being of the plants. There are a few kinds that need special treatment. The yellow-flowered, drooping-habited E. depressa should be stood out in the full sun from the beginning of June until autumn, or it will not set its flowers freely. This sort does not usually bloom well two seasons together. One of the finest Heaths in cultivation, E. Cavendishiana, will bear to be placed after flowering in a comparatively warm, close, moist atmosphere, such as suits Azaleas, while making their growth; previously, when it gets too tall, its branches may be cut in much closer than most other sorts will do with; it will bear shortening in to the extent of one-third, but after it has made growth in such a structure it should be exposed to the open air for a month before autumn, or it will be too soft to winter well. The winter-flowering kinds, of which E. hyemalis may be taken as a representative, should after blooming have their strong shoots cut freely back, or they will soon get too tall. The spring-flowering E. propendens ought to be treated similarly.

The following are a selection of the best kinds that will give a succession of flower over a great portion of the year; they are alike suitable for exhibition or home decoration. They constitute the cream of the large number of species and varieties in cultivation.

E. æmula. A very fine compact-growing variety. Flowers pink and green; a profuse bloomer. Flowers from June to August.

E. Aitoniana Turnbullii. A handsome variety. Flowers white, slightly suffused with pink. June to August.

E. ampullacea obbata. A beautiful, large-flowered kind, with stout, flask-shaped tubes, white, shaded with pink. June and July.

E. aristata superba. A close compact-habited sort. Tube of flower brownish red, segments white. May to July.

E. Austiniana. A very fine, free, large growing kind. Tube of flower deep red, white at the extremity. July to September.

E. Candolleana. A moderately large compact grower; a profuse bloomer. Flowers white, suffused with red. May and June.

E. Cavendishiana. A very large free-growing variety; a profuse bloomer. Flowers yellow. May to July.

E. cerinthoides coronata. A free-growing, weak-wooded kind, with brilliant scarlet flowers. August to September.

E. depressa multiflora. A slow-growing, dense, bushy-habited kind, that bears yellow flowers. May to July.

E. Devoniana. Attains a medium size. Flowers deep brownish red. April to June.

E. elegans. A very handsome and distinct-looking species. A slow grower, lasting in bloom a long time. Flowers rose colour, tipped with green. May to July.

E. eximia superba. A medium-growing,

compact-habited sort; a profuse bloomer. Flowers red tipped with green. May to July.

E. exquisita. A very handsome large-flowered kind. Tube much inflated, white, suffused with pink. June to August.

E. Fairrieana. A free-growing, profuse bloomer. Tube pinkish white, purple towards the extremity, segments white. June and July.

E. ferruginea superba. A free-growing handsome kind, with bright pinkish-red flowers. July and August.

E. gracilis. A pretty small-flowered kind, with reddish purple tubes. Blooms in autumn and winter.

E. gracilis vernalis. Similar to the last. Flowers in winter and spring.

E. Hartnellii. A handsome variety, with red flowers. May and June.

E. hyemalis. A favourite winter-flowering kind. Tubes pink, paler towards the extremity. December to March.

E. insignis. A beautiful variety; a free bloomer. Flowers deep crimson. July to September.

E. Irbyana. A free, large-growing kind. Blush white, red at the extremities of the flowers. July and August.

E. Jacksonii. A free-growing, free-flowering variety. Flowers deep red. July to September.

E. Lindleyana. A fine, distinct-looking sort. July to September.

E. MacNabiana rosea. A handsome and distinct-looking kind. Tube deep rose. April and May.

E. Marnockiana. A splendid variety; a profuse bloomer. Tube red, almost black at the extremity, segments white. July to September.

E. Massoni major. A grand kind, with distinct habit. Tube red tipped with green, June to August.

E. mutabilis. A distinct-looking, free-growing species, that blooms several times in the year. Flowers pale red.

E. obbata. One of the grandest of all Heath. ; grows to a moderate size. A profuse bloomer; flowers very large; tube much inflated, white suffused with rose. June to August.

E. opulenta. A very handsome variety. Flowers large; crimson lake, red at the extremity of the tube, segments white. September and October.

E. Parmentieriana rosea. A free-growing, free-flowering, distinct variety. Flowers rosy-crimson. July and August.

E. Paxtonii. A handsome, free-growing, free-flowering sort. Tube pale red, with green, purple-tinged extremities. June to August.

E. propendens. An elegant-habited species; a profuse bloomer. Flowers reddish lilac. May to June.

E. retorta major. A dense, but large-growing variety; a profuse bloomer. Tube deep red, segments white. July to October.

E. Shannonii glabra. One of the best white Heaths; a good grower and free bloomer. July to September.

E. Shannonii Turnbullii. A distinct and handsome variety; a very free bloomer. Flowers white, tinged with pink. Summer.

E. tricolor coronata. A free-growing, distinct, handsome sort. Flowers whitish pink, green at the extremity of the tube. June to September.

E. tricolor Eppsii. A small-growing variety, with very large flowers. Tube reddish pink, banded with green at the extremity. July and August.

E. tricolor Wilsonii superba. A beautiful free-growing, free-blooming kind. Flowers pink, shading to red, green at the extremity. June and July.

E. ventricosa Bothwelliana. A distinct and very desirable sort; a profuse bloomer. Flowers flesh-colour, shading to red. Summer.

E. ventricosa coccinea minor. A beautiful sort, with compact habit; a profuse bloomer. Tube reddish pink, dark red at the extremity. May and June.

A. ventricosa grandiflora. A magnificent kind, a free bloomer. Flowers bright rosy crimson. May and June.

E. ventricosa magnifica. A fine variety; one of the best of the ventricosas. A free bloomer; flowers bright reddish crimson. May to July.

E. Victoria. A dense, compact, free-growing sort; a profuse bloomer. Tube very dark crimson, segments white. April and May.

E. Wilmoreana. A free-growing, free-blooming variety. Tube short, purple, shading to white at the extremity. February and March.

INSECTS.—Heaths possess one great advantage over most other plants—they are little liable to the attacks of insects. Scale, both brown and white, will live upon them. In the case of a plant affected with the latter it is much better to destroy it at once than to run the chance of the insect being communicated to others. The brown species is less difficult to deal with, although not easy to eradicate; where present it is confined principally to the wood. It may be kept down by the use of brush and sponge, and washing with a moderately strong solution of insecticide in the autumn after growth is completed. They should be looked closely over at intervals to see that they are free from mildew, to the attacks of which they are more or less liable; and if any trace of the parasite is discovered dust the affected plant over with flowers of sulphur, laying it down on its side to keep the sulphur from getting to the soil, for if washed down to the roots (as would occur in the operation of watering) it would be highly injurious. Allow it to remain on for a few days, after which wash clean off with the syringe.

ERIOSTEMON.

These evergreen greenhouse plants are natives of New Holland and New South Wales, and in every way deserving of general cultivation. They are comparatively easy of growth, not subject to die off suddenly, or get out of health; they are profuse flowerers, and their pink buds and white flowers render them well adapted for associating with other plants in bloom or otherwise. Their natural season of blooming is March, April, May, and June, according as they have been prepared by retarding or otherwise; but, if required, they can be brought into flower much earlier in the winter, as they will stand moderate forcing, more especially the Box and Oleander-leaved varieties, E. buxifolius and E. neriifolius; they also will bear treatment and grow under conditions that would be fatal to many hardwooded plants, and are thus suitable for beginners in the cultivation of hardwooded greenhouse plants. They flower freely in a small state, and consequently are well adapted for conservatory decoration, where, if allowed sufficient room, they will receive little injury during the time they are in flower. Even when not in bloom, their dense fresh green foliage renders them at all times interesting if they are well grown. They are the freest-rooting of New Holland plants, and cannot bear cramping for want of pot-room in the early stages of their existence; they rarely make good healthy progress if they have been at all pot-bound. They will bear without injury a continuous lower temperature during the winter season than most plants, but in their early stages they should never be submitted to such treatment, as it has a tendency to check root-action.

Eriostemons are easily propagated from cuttings made of the points of the half-matured shoots, such as are to be had about the beginning of August; these should be put in, about 3 inches long, several together, in 6 or 7 inch pots, filled with sand, and kept close, moderately moist, and shaded in an intermediate heat. Here they should root sufficiently to bear moving singly into small pots during the autumn; keep through the winter in a temperature of about 50° by night, and pinch out the points of the shoots before growth begins in spring. About the end of May enough root-progress should have been made to admit of their being moved into 3-inch pots; shade slightly in bright weather through the spring and summer, give air in the middle of the day, moisten the stage and paths, and use the syringe overhead at the time of shutting up. Treat through the autumn so as to induce the ripening of the growth, and winter at about 45° in the night. Towards the end of March give a 3-inch shift in good fibrous peat, to which one-sixth sand may be added.

It is not necessary to break the peat so small as in the case of such plants as are more spare and tender-rooted, but let the sand be well mixed with the peat, as they, like all others that have a greater comparative amount of leaf-surface, require more water, and consequently must have the soil in which they grow in such a condition as to admit of the water passing through it without danger of getting in the course of time too retentive. If the plants have any over-strong shoots, these should be cut well back, or they will draw the sap from the branches near the base of the plant so as to completely spoil them. Bring down to the rim of the pot all the strongest central branches, leaving such as are weaker upright, in which position they will gain strength, and thereby equalise their growth. With Eriostemons it is necessary to be more particular in the matter of training than with most plants, as they have a natural disposition to push these over-strong branches that rob the weaker ones. Place them in a house where they will be kept at a night temperature of not less than 45°. Close the house early; keep the atmosphere in a state conducive to free growth by a liberal use of water on the stages and paths. As the weather gets warmer in May syringe the plants overhead every afternoon. This not only promotes growth, but keeps in check red spider, by which they are sometimes attacked; continue the use of the syringe every afternoon until the end of August, after which they should be gradually hardened off by a drier atmosphere, and the admission of plenty of air night and day through the following month. Eriostemons are not subject to mildew, consequently there is no necessity at this stage of their growth to expose them in the open air with a view to hardening them, and this more especially as the object for the coming season will not be the production of flowers. Winter them in a temperature similar to that advised for the preceding season—this will keep their roots from getting quite dormant, and will enable the plants to move into growth freely in the spring; pot them at the end of March, giving a 3-inch shift, and encourage free growth by giving little side air and shutting the house completely early enough to enclose a good amount of sun-heat. As the season advances again commence to use the syringe every afternoon. Attend well to their training, so as to keep them dense and well furnished at the base; upon attention to this in the early stages of their growth depends their after condition, as, if they are once allowed to get bare of foliage at the bottom, it is not easy to get their strong upright-growing branches down so as to furnish them as they ought to be, and bare naked bottoms are at all times intolerable. They will, if all has gone well, be large enough to make nice decorative plants the following spring.

Such as are required for flowering should be fully exposed to the open air from the middle of July until the end of September. This open-air ripening cannot be dispensed with, if a dense sheet of flower is expected, and these plants, unless profusely bloomed in this way, are not, on account of the small size of the individual flowers, sufficiently attractive. By the end of September they must be brought indoors; they do not require to be placed in the best position in the house as to light by reason of their making no growth during the winter, but they must on no account be stood too close together, or the bottom leaves will suffer and fall off prematurely. A temperature of 40° at night will be sufficient to winter them in; they will come into flower during March or April, when they can be removed to the conservatory, where they will be attractive for several weeks. After they have flowered the seed-pods must be at once picked off, or they will seriously retard the growth of the plants.

If the object is to grow them on quickly to a large size, they should not be turned out in the autumn, but be kept under glass, as advised the first season, and wintered a little warmer, given a 3-inch shift again in March, and grown freely all through this their third summer until the middle of July, when they must be turned out, as before recommended for such as were required to flower. Remove them under glass before there is any danger of frost, and keep them cool during the winter if the object is to induce them to bloom late. If they are required for exhibition they should, when removed under cover in the autumn, be at once placed in the north house, where they will do well through the winter; here they will come on much more slowly than in the ordinary hard-wooded house. It is necessary to treat them so when wanted for showing, as unless retarded all the winter they come into flower too soon, and their blooming will be half over before they are required. The plants will need little difference in their treatment to keep them in good condition for two or three years, when they may be potted again, giving them 4 or 6 inches more room, after which, when the soil becomes at all exhausted, they must be assisted with manure-water during the growing season.

The following species are deserving of cultivation, and all require similar treatment:—

E. buxifolius. This is one of the best known and commonly grown species; it is a free grower and profuse flowerer.

E. cuspidatus. Is an erect grower, has moderate-sized leaves, and is a free-flowering and desirable plant, when strong, producing its flowers in bunches of five or six at every leaf.

E. intermedius. This has larger flowers than the other kinds, but is not so good a grower, never pushing such a number of branches, and having a much thinner appearance; nevertheless, it makes a nice, moderate-sized plant.

E. linearifolius Forms a nice companion plant to the others. It is a very free grower, its flowers are smaller, and more hidden by the leaves than those of the more robust-growing sorts.

E. neriifolius. The best of the family; good in constitution and habit, a very free flowerer, the individual blooms large, and produced in great quantities. A profusely-flowered plant of this sort is very effective on the exhibition stage.

E. pulchellus. Is a weaker-wooded plant, yet grows very close and compact; it does not form so large a specimen as some of the others, nor are its flowers so conspicuous.

INSECTS.—Eriostemons are not very liable to the attacks of insects, although they are sometimes affected with red spider, which the use of the syringe, as before recommended, will keep down. White and brown scale will also live upon them; it is a difficult matter to destroy the white insect, as the leaves are unable to withstand any application sufficiently strong to kill it. Insecticide strong enough to destroy brown scale, without injuring the leaves in the least, may be used. They should be thoroughly washed with the mixture twice within ten days immediately after flowering, before growth has commenced. The way this insect principally injures the plants is by coating over with its excrement the upper surface of the leaves, as if they were varnished, clogging the pores, and causing them to prematurely turn yellow and fall off. This washing has also a beneficial effect in removing dust that adheres to the foliage and becomes fixed in the small drops of glutinous fluid that are secreted by the flowers.

ERYTHRINA CRISTA-GALLI.

This greenhouse species of the Coral tree is from the cooler regions of Brazil; it belongs to a splendid genus of plants, many of which acquire a considerable size in their native country, but grown as a pot specimen it can easily be kept within reasonable bounds. That this Erythrina is not more generally cultivated can only be accounted for by the reason of its having no pretensions to being new in the country, and on that account, like numbers of other things of real merit, it is comparatively neglected. It has a very distinct appearance—the peculiar form of its large coral-red flowers, produced freely at the axils of the leaves for three-fourths the length of stately shoots, 4 or 5 feet high, backed by handsome glossy foliage, makes it when well managed one of the finest conservatory plants grown. It is frequently subjected to stove treatment, by which it can be induced to flower twice in the year—spring and autumn—but when thus grown in heat the shoots are always more or less drawn up in a way that gives it a weak loose appearance, much inferior to its character when in the cooler atmosphere of the greenhouse.

It is of very easy culture, succeeding in either peat or loam, or in a mixture of both, but good loam is preferable, as in it the growth is somewhat more compact, the leaves smaller, and the flowering more profuse.

Cuttings such as produced in the spring from the collars of established plants should be taken off with a heel when about 5 or 6 inches long; put singly in 3-inch pots in sand, kept close, moist, and shaded in a moderate stove-heat, they will root in five or six weeks, when dispense with covering, and as soon as they begin to grow away freely move into 6-inch pots. When the roots have fairly entered the new soil subject the plants to greenhouse treatment, with air and plenty of water to the roots, and syringe daily. In the autumn when growth ceases they should receive very little water—only just as much as is requisite to keep the soil from getting quite dry, as the object is to check any disposition to growth, and the plant, unlike most others, will bear this kind of treatment without injury. This partial drying-off will cause the previous summer's shoots to show signs of dying down, and when this is apparent they may be headed back to within a few inches of the collar. They should then be placed for the winter in an ordinary greenhouse, and in spring, as soon as shoots spring up from the base and have acquired a length of 3 or 4 inches, the plants should be turned out of the pots, the greater portion of the old soil carefully shaken from the roots, and repotted in good fibrous loam, to which has been added one-sixth of rotten dung sifted quite fine; break the loam up with the hand, but do not make it too fine, and mix with the whole a good portion of sand. Give sufficient drainage, for although in the case of a plant like this, that should in a measure be shaken out every season, it is not necessary to take so much precaution in drainage as for things that cannot bear the interference with their roots consequent upon a renewal of the soil, so much water is required through the growing season that both soil and drainage must be such as will admit of its passing freely away. Plants of the size above spoken of will bear a 10-inch or 12-inch pot; the soil should be made moderately firm. After potting replace in the greenhouse, but do not give more water than will just keep the soil a little moist, until the roots begin to move freely, when more will be needed. As the weather gets warmer, syringe overhead every afternoon so as to moisten the leaves all over. This will encourage growth, and keep in check red spider, by which it is sometimes affected. When the shoots get a foot or so long, but before they are too stiff, tie them out in a horizontal position towards the sides of the pot, but do not bring them too low, or they will cease growing from the points and break back, which with this Erythrina is not desirable; nor should the points be stopped at all, but simply allowed to grow on to a flowering state. Give plenty of light and air, so as to keep the growth stout and compact. When the shoots have extended so as to require it, put to each a neat stick sufficiently strong for support. The plants will need nothing more than attention with water, and when the flowers begin to show, and the ball is full of roots, liquid manure may with advantage be given twice a week. The blooms will commence to open about July, when they can be placed in the conservatory, where they will be found very effective at a time when the greater portion of flowering subjects are over. When done blooming the plants may be stood out-of-doors and supplied with water until they show signs of going to rest, when the quantity given must be much reduced, as in the preceding autumn, after which cut the shoots down and winter as before. In the spring again shake them out and remove into pots 4 or 6 inches larger, which will be as big as ever they will require, and treat in every way as advised for the previous season. So managed they will go on for a number of years, throwing up a score or more strong blooming shoots.

INSECTS.—This Erythrina is not usually much troubled with insects; if greenfly makes its appearance they can be destroyed by fumigating; red spider will rarely affect it if syringing is attended to as recommended.

EUCHARIS.

Of all plants requiring stove treatment that have been introduced into Europe during the present century there are few, if any, that have become more general favourites than Eucharis amazonica, or that better deserve to be grown by all who have the convenience of a house wherein a sufficiently high temperature can be maintained. When this plant first made its appearance in this country the extreme purity of its lovely white flowers, combined with their exquisite fragrance, at once produced an impression in its favour, even though imperfectly grown—imperfectly so far, that the small-pot culture, to which it was then thought best to confine the plant, was not such as to admit of that full development which it has since exemplified under more liberal treatment. The restriction of its roots to promote flowering has been found to be altogether unnecessary and to seriously prevent the bulbs from increasing as they would do if accommodated with plenty of space. In this it differs from most bulbous plants, the generality of which do not succeed well under pot culture unless their roots are somewhat confined. It has no particular season of flowering; with suitable treatment the same plants will bloom two or three times in the course of the year if subjected to alternate short seasons of growth and rest. To do it full justice it should not be moved when in bloom to a conservatory or other house cooler than that in which it has been brought into flower. Growth should immediately follow the production of bloom, and it naturally receives a check if taken from a warm to a cold temperature. It is a remarkably effective plant in the stove, its ample deep green leaves setting off to the best advantage the numerous umbels of wax-like flowers that rise well above them. It is, however, especially for the production of cut flowers for filling vases and for bouquets that it is most valuable, almost rivalling in these respects the Camellia itself. In addition to the individual flowers standing well when cut (which their peculiar texture and substance ensure) each umbel opens its blooms consecutively so that almost every flower can be used as required, a circumstance that has made the plant a general favourite with those who grow flowers for market, or who have to provide for private establishments where a continuous supply is needed.

Propagation is effected by separating the bulbs, which increase moderately fast when well grown, but, like most other evergreen bulbous plants, it does not like to have its roots much disturbed. Interfering with them, to the extent necessary when separating them, has the effect of retarding growth for a time; therefore plants of this Eucharis should only be broken up when they have either got larger than is requisite, or when it is desirable to increase their number. The time for carrying out the operation should also be chosen when growth is complete; it should not be attempted when the leaves are in course of formation, or when they are not fully matured. Let us suppose that early in the spring a large plant exists which it is deemed advisable to break up. Turn it out of the pot, and, if the roots are very much matted and the soil is of an adhesive character, it will be difficult to separate them without breaking; to avoid this place the plant in a tub large enough to admit the ball, half fill it with tepid water, and work out all the soil with the fingers, which will leave the roots so that they can be separated with little breakage. The bulbs may be divided with a knife at the point where they adhere to each other, or they may be parted by hand, singly, or two or three together, and put in pots from 5 inches to 7 inches in diameter. When growing, a copious supply of water is required; consequently the pots must be well drained. This Eucharis will thrive in good turfy loam, to which add as much sand as will keep it porous. Pot firmly without injuring the roots, and cover the bulbs to about half their depth. Do not give much water until growth has commenced. Place them at once in a

EUCHARIS AMAZONICA

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temperature of 70°; if they can be plunged in a bottom heat 10° higher, they will progress all the quicker. In this temperature they will grow fast. Shade slightly during the hottest part of the day in very bright weather, but in doing so do not darken the plants too much, or they will grow up weakly. Let them have a moderate amount of air early in the day, shutting it off in good time in the afternoon, and syringing overhead at the same time. They will bear during summer as much heat as the generality of stove plants. It will not be advisable the first summer to rest the smaller bulbs for flowering, as it will be better to get as much growth as possible. Early in August shift them into pots 2 inches larger than those they are in; continue to give them a liberal amount of heat and moisture, both at the roots and in the atmosphere, until autumn, when they will have made considerable progress.

At this time, when the leaves are fully matured, cease shading, and gradually withhold water till the soil gets so dry as to cause the leaves to flag slightly; do not let them be injured by the want of it, but give a little just to freshen them up, and again alternate the treatment by drying and then slightly watering them. Continue this treatment for a month, during which time they can be kept in a night temperature of 55°, with a few degrees more warmth during the day; then they may be well watered and placed in 10° more heat—if they can be plunged in 10° higher than this it will be still better. So managed they will quickly push up their flower-stems, and they should be encouraged by being supplied with plenty of water at the roots and as much heat as is consistent with the diminished light of the season. Thus treated, when their blooming is over they will grow on slowly through the winter, and after their full development they may be again submitted to the drying and resting process, after which increase the temperature, give water, and treat them in every way as before. This alternate growing, resting, and flowering can be practised two or three times in the year with the best results without injuring the plants in the least. Do not at any time pinch them as regards pot-room. When the soil is well filled with roots they will be much benefited by a good soaking with manure-water once or twice a week. For general purposes moderate-sized plants in 12-inch or 13-inch pots will be found the most convenient, but where it is desired they may be grown on into specimens 6 feet across by simply using pots or tubs proportionate in size. When large they make fine exhibition plants, their general appearance being such as to contrast well with their associates.

E. candida differs little from E. amazonica, except that the flowers are much smaller and more elegant; the foliage is also distinct. It is a native of the United States of Colombia, and a most desirable kind.

E. Sanderii has pure white flowers in the way of those of E. amazonica, 2½ inches to 3½ inches in diameter; it will be an acceptable addition to stove bulbous plants. It comes from New Grenada.

INSECTS.—Most of the pests that infest stove plants will live upon Eucharis, but from the nature of the leaves, they are more easily destroyed than on many plants. If thrips or greenfly make their appearance, fumigation will generally be found to be the best remedy, but from the regular use of the syringe these and red spider are not often troublesome. Should scale or mealy bug gain a footing they must be diligently sought for and removed by means of sponging, using a soft brush for the bases of the leaf-stalks where the bugs will be found to lodge; for, if not destroyed, they will increase greatly and both disfigure the plants and do them serious injury by the constant cleaning process which their presence makes necessary.

EUGENIA.

These are evergreen plants varying in habit; some are shrubs, whilst others assume the proportions of trees. Only a few are worth growing under glass, and these cannot be counted as above second-rate in comparison with the many desirable plants with which our greenhouses abound. They can be propagated and grown on similarly to Myrtles, which see.

The two species best adapted for cultivation in a greenhouse are:—

E. apiculata. A white-flowered kind, from Chili.

E. Ugni. Bears white flowers, and is also a native of Chili.

EUPHORBIA.

The genus Euphorbia comprises a large number of plants, existing in a wild state under the most opposite conditions of heat and cold, dry and moist atmosphere, from the Valerian-leaved (E. valerianæfolia) of Siberia to the curious-crested angled E. lophogona, that flourishes in the hot regions of Madagascar, the interesting E. orientalis from the Levant, to the splendid scarlet flowered Mexican E. jacquiniæflora, one of the most effective of our winter-flowering plants. Although the genus is represented by such a number of species, there are only two that commend themselves to the attention of the cultivator of stove plants—the last named—E. jacquiniæflora (or fulgens) and the ever-flowering E. splendens, from the Isle of France. The latter was at one time met with in every stove, and though of late years not so much grown as formerly, it is being brought into favour again by the fashion for button-hole flowers, as the colour as well as the endurance of its flowers especially adapt it for the purpose. There is another very useful property possessed by this species of Euphorbia to an extent existent in few plants, that is the continuous succession of flowers it produces. A fair-sized specimen under good treatment will keep on blooming the whole of the year round. We have had a plant of this Euphorbia that was never out of flower for seven years, and for anything we know would have continued as much longer were it not that it had to be removed for some alterations. Where cut flowers for the above purpose, or for putting in small glasses, are required, we know of no plant that will produce them so continuously; it also possesses the merit of being easily grown. Its general habit, and the treatment it requires, is so different from E. jacquiniæflora, as to demand being dealt with separately.

E. splendens is of a succulent nature, armed with numbers of stout spines; the leaves are comparatively small. Cuttings made from firm pieces of the wood will root at any time of the year, but are generally the most satisfactory when struck in the spring. Pieces of the points of the shoots, taken off 4 or 5 inches in length, and let to lay for a day in the stove after being severed from the plant, so as to allow the base to dry up a little, should then be put singly in small pots, drained and filled with a mixture of two-thirds silver sand to one of sifted loam; they will root readily, but must not be kept too wet or covered with a propagating glass, as from their succulent nature and the comparatively little leaf-surface they possess, they do not require to be confined to prevent flagging, as in the case of most plants; place them in a temperature of 65° in the night. When struck they may be allowed to remain in the small pots until they have made a considerable quantity of roots. As solar heat increases, the house may be kept 5° warmer in the night, and the temperature increased to 80° in the daytime, with sun heat. In June put them in 5-inch pots; these should be drained to one-fourth their depth, and the crocks covered with a little fibrous material. They will do the best in good loam, broken by hand into small pieces, to which is added one-sixth crocks, broken to the size of horse beans, and a like quantity of sand. In the cultivation of this Euphorbia thorough drainage and porosity of the soil are indispensable to success, and care should be taken never to over-pot; it does not require near so much root-room in any stage of its growth, proportionate to the size of the plant, as most things. No shading is necessary, as it is naturally a sun-loving subject, the lighter the situation and the more fully exposed to the sun, the stouter will be the growth, and the greater the amount of bloom. As soon as they have got fairly into growth, take off the points to induce them to break several shoots; give water as required, but the soil should never be kept so wet as for plants possessing more leaf-surface and of a less succulent character. The treatment needed through the summer will be nothing more than a continuation of that already recommended; give air every day, and keep them in the driest part of the house, as they do not want so much moisture in the air as the generality of stove plants, such an atmosphere as is suitable for Pines being more in accordance with its requirements in this respect. In autumn reduce the heat, and keep them through the winter in a night temperature of 60°, with 5° or 10° more in the day. In the spring, again, gradually give more heat as the days lengthen, and shift them into pots 2 or 3 inches larger, using similar soil to that previously advised. The plant is naturally of a branching bushy habit, and does not generally require much stopping; but, if such appears to be needed, let it be done in time to induce their being well furnished with shoots at the base; it is naturally so free a flowerer that it will bloom in a very small size without much interfering with its growth; consequently as the flowers appear they may be allowed to open, and can be used as required. Put a stick to the main stem sufficiently stout to give the necessary support, and a few to the outer branches, as the head is naturally heavy and requires to be thus held in shape. The after management requisite will simply be a continuation of the above treatment; each year give a little more pot-room as required until the specimens get to the size wanted, when they may be kept in a growing condition by the help of manure-water during the summer, and at times examine the drainage to see that it is right. The plant is well adapted for covering a wall in the stove, and there is no situation where it looks better, or where its peculiar form and intense scarlet flowers are seen to more advantage; but the position in which it is placed should always be a light one.

E. jacquiniæflora is very different in habit and general appearance from the last; it blooms in winter, at which time its intense scarlet flowered, wreath-like shoots are unsurpassed by any plant in cultivation. It is a free-grower, and equally free in blooming; the flowers last well either on the plant or when cut and placed in water; it gives a succession from a second growth, which the plants will make after the first flowering shoots have been cut. The beauty of the flowers is much enhanced by the dark-green lanceolate leaves which form a background to them; it combines well with almost any other description of flower, being especially suited for using in large vases, where its flat sprays can with the greatest advantage be employed as a base for lighter-coloured things. Some growers have experienced a difficulty in striking it from cuttings. The soft sappy nature of the young shoots, if they are taken off after they have extended considerably, causes a liability to damp; in fact, if cuttings are made in the ordinary way, very few will root. But if in the spring the young shoots that are made after the plants have bloomed are taken off with a heel when about 5 or 6 inches in length and inserted in small pots, drained, and filled with silver sand, placed in a temperature of 70°, and covered with propagating glasses, not one in twenty will fail; it is the heel of partially solidified wood that is essential to success. They must be kept quite moist, and so managed will root in a few weeks, after which remove the glasses, and let them have plenty of light. When they get fairly established move them into 4-inch pots. It does the best in good fibrous loam, to which add one-fifth of sand, and drain the pots sufficiently, as the roots are very impatient of stagnant moisture; do not give too much water till they get well hold of the soil. The plant has naturally an erect habit—not disposed to branch out much; if required bushy, the shoots may be stopped or bent down when they get fairly into growth, so as to induce them to break back. The temperature may now be allowed to rise in the day to 80°, with sun heat, and air be given in the morning according to the state of the weather; close while the sun is on the glass sufficiently to raise the heat for an hour or two up to 85° or 90°, syringing overhead at the same time; be careful at all times, but especially after potting, not to over-water, for the plant does not make so many roots as most things, and will not bear the soil being too wet; they will require a thin shade when the sun is powerful, but should have plenty of light, or the natural straggling habit will be still further increased. By the end of June they ought to be moved into their flowering pots; those 6 or 7 inches in diameter will be large enough, using soil similar to that in which they were last put, with the addition of one-sixth rotten dung; as soon as established give manure-water regularly. Place a single stick to each plant, which will be sufficient to support them; continue the treatment as to heat, air, and a thin shade when necessary, until the end of August, when dispense with shading and the use of the syringe, and give more air, which will gradually discourage further growth and ripen up the shoots. As the autumn advances reduce the temperature to 60° in the night, giving 5° more in the day. If they are required in bloom by the end of the year, it will be necessary to keep a portion of the plants 5° warmer, and they should be placed where the tops of the shoots will all but touch the glass. This is necessary to impart both colour and substance to the flowers. As the flowers become apparent at the axils of the leaves the plants will be benefited by manure-water, which will not only assist the first blooms they make but enable them to push the second growth strong, which will also bloom. Such plants as are kept cooler to succeed the first lot must not have too much water at the root, especially if they are kept a little under 60° in the night, but it is not safe to submit them to a much lower temperature than this; before they are required to bloom they must be kept warmer, and the increased heat will in a few weeks cause the flowers to open. After the flowering is over allow the soil to get considerably drier, and head the plants down to within 6 inches of the pots; keep them in a temperature of 65° in the night, and give no more water than will just prevent the soil getting quite dry, until they have broken, and made several inches of growth, when, if more plants are required, the shoots may be taken off and struck, as in the preceding spring. The rest of the plants should be turned out of the pots, two-thirds of the old soil removed, and be given pots 2 inches larger, which will be big enough to grow them on through the ensuing summer; assist them with manure-water when the soil gets well filled with roots, and treat in other respects as advised for the preceding season. This Euphorbia is also very suitable for growing on a back wall, in which position it looks well; but the flowers will not be so high-coloured as when they expand in close proximity to the glass. If planted out in such a situation the border should be limited in size, as if the roots are in too great a body of soil they are very liable to decay when the plant is hard cut in, which it will require after blooming, at which time and until some growth has been made, the soil must be kept almost dry. Through treatment the opposite of this, when so situated, the plant often dies after being cut back; otherwise, as also when grown in pots, it will last for years.

INSECTS.—Both these Euphorbias are less subject to insects than are most stove plants, although thrips and spider will sometimes attack them; syringing and fumigation are the best means for their destruction. Should mealy bug make its appearance, lay the plants on their sides, repeatedly syringe freely with tepid water and wash with insecticide in the winter when at rest; dress similarly for brown scale in the dormant season, and use the sponge when the plants are growing, as at this time they would not bear an application of insecticide strong enough to kill the insects. White scale is so difficult to thoroughly eradicate when once it gets upon stove plants such as these, that are easily propagated and grown quickly, that where it exists it is better to start afresh with clean cuttings.

EURYA LATIFOLIA VARIEGATA.

This handsome plant is a variegated variety of the Japanese Eurya latifolia. It differs from the normal form inasmuch as half the surface of the leaves is white, and whilst young suffused with red, giving the plant a distinct and handsome appearance. In form the leaves are most like those of the Orange but somewhat smaller. It is a useful subject for greenhouse or conservatory decoration, its bright foliage livening up the darker hues of the green-leaved plants with which it is associated. It is a free grower, forming a moderately dense bushy pyramid; it strikes freely from cuttings made from the points of the shoots in a half-ripened condition, such as are usually in a suitable state about July, when the current season's growth is partially solidified. Select those that are of medium strength, take them off with about three or four leaves, severing at a joint; put three or four together in 6-inch pots filled with sand, keep moist, shaded, and covered with propagating glasses in a temperature of 70°. They may be expected to root in about two months, when remove the glasses gradually, and place singly in 3-inch pots in good fibrous peat with some sand added; keep moderately close until the roots begin to move freely in the soil, and afford for a few weeks a temperature of about 60° by night, with a rise in the day proportionate to the time of the year. Afterwards reduce it to 50°, the object being to just keep the young plants moving slowly through the winter, particularly in the formation of the additional roots necessary to support the top-growth that they will make in spring. Give a little air in the day when the weather will permit, and water as the soil seems to require it. Towards April they will need moving into 5-inch pots, and soil similar to that of the first potting should be used.

This Eurya is only a little short of being hardy in the mildest parts of England, but it will be best to treat the young stock through this first summer to an intermediate temperature, say 55° to 60° in the night and 70° to 75° by day, with more air in the daytime than admitted to the occupants of the stove. Pinch out the points of the leading shoots to cause the lower eyes to break, with a view to the plants being sufficiently clothed down to the base. Shade slightly in the middle of the day, keep the atmosphere moderately moist, and syringe overhead at closing time in the afternoons. By the end of June pots 2 inches larger will be required, and the soil now used should be more lumpy. If the plants do not branch out sufficiently they must again have the points of the strongest shoots pinched out. Continue to treat as before until the middle of September, when cease shading and syringing overhead, give more air and gradually reduce the temperature to that suited for the generality of greenhouse plants—say 40° in the night—keeping them at this through the winter. Give pots 2 or 3 inches larger about April, and pinch out the points of the strongest shoots. Ordinary greenhouse treatment will be the best after the plants have reached this stage; continue to syringe overhead in the afternoons in bright weather, give plenty of air and light, and shade so far as found needful to prevent injury to the leaves, to which, in common with other variegated-leaved plants, it is more subject than are those that have their foliage wholly green. Beyond this nothing more will be required except additional pot-room as needed. When the plants have grown to a size of 6 or 7 feet, forming, as when well managed they do, handsome densely-clothed pyramids, they are very effective in a large house. When they get thin and straggling they will bear cutting back in spring moderately close, which will cause them to break out and get reclothed with new branches; they should be put in a little heat, and freely syringed overhead until they have made new growth.

INSECTS. — Aphides, thrips, and red spider will live on this plant, but, where syringing is attended to in the growing season as advised, they are seldom troublesome; if these insects make their appearance fumigate and wash with insecticide. Should scale affect it, the leaves must be carefully sponged.

EURYALE FEROX.

This is a splendid stove aquatic, the only species of the genus known. It has very large leaves, often growing to a size of 3 feet in diameter. Like those of Victoria regia, they float on the top of the water. The flowers are large, in colour red, with a shade of violet. It needs a large tank to grow in, and the water, as well as the house in which it is located, should be kept at a high temperature.

It is raised from seeds which require to be sown and treated similarly to those of Nymphæas, which see. It flowers towards the latter end of summer. A native of India.

EURYCLES.

A small genus of stove Bulbous plants, nearly allied to Pancratiums; they bear handsome flowers, and require to be treated, both in their propagation and after growth, similarly to Pancratiums, which see.

E. amboinensis (syn.: Pancratium amboinense). Flowers white. From Amboyna.

E. australasica (syn.: Pancratium australasicum). Flowers white. From New Holland.

E. nervosa (syn.: Crinum nervosum). Flowers white. From the East Indies. All are spring bloomers, varying in accordance with the time they are started, and the temperature that is kept up.

EUTAXIA.

These are evergreen greenhouse shrubs from New Holland; they are slender-growing plants with a somewhat elegant appearance when in flower, yet not so effective as many others from that and adjacent parts. They are moderately quick growers; the method of their propagation and after treatment is similar to that advised for Boronias, which see.

E. Baxterii. Orange-yellow.

E. myrtifolia. Orange.

FABIANA IMBRICATA.

An evergreen shrub, almost hardy in the mildest districts. A native of Chili. It blooms in spring, and has pretty white flowers. It is the only species of the genus in cultivation, and does not possess any particular merit.

Treatment similar to that advised for Mitraria coccinea will suit it.

FAGELIA BITUMINOSA.

An evergreen twining greenhouse plant with yellow flowers, produced in summer. It can be propagated and grown on in the same way as advised for Kennedyas, which see.

A native of the Cape of Good Hope.

FICUS.

(Stove.)

Of Ficuses, there are now several fine-leaved kinds in cultivation without including the well-known India-rubber plant (F. elastica). Although not requiring exactly the same cultivation, they can all be struck from cuttings made of bits of the young shoots; these, if taken off early in spring and inserted in sand in small pots, kept warm and shaded in a confined atmosphere, will root in a few weeks, after which they should be moved to pots a little larger, in peat or fibrous loam. The kinds named below from hot countries require a considerable amount of heat. Through the latter part of spring and in the summer they will bear 70° at night, and they may be kept proportionately hotter during the daytime; shade, too, should be given when required, and air according to the state of the weather. Give larger pots as the roots seem to want more space, but they can be grown without so much root-room as some plants need, as they are gross feeders, and when once fairly established can be kept in good condition by the help of manure-water, of which they will bear a large amount. In common with all other plants of a similar character, they look best when confined to a single stem, and should therefore be, all through their growth, placed sufficiently far apart to admit of their leaves, during formation, being fully exposed to the light, or they will lack the tough texture requisite to enable them to last long in good condition. By autumn the young stock will have made considerable progress; reduce the temperature before winter, when 60° at night will answer; give less water during winter, but the soil must not be allowed to get so dry as to injure the foliage. Give additional pot-room in spring and treat them as before in the matter of heat, air, water, and shade. If afforded sufficient room they will grow large, but for most purposes it will generally be found better to retain them only so long as they are within a limited size, and to propagate young plants to take the place of the old ones.

The following will be found to be desirable kinds:—

F. Cooperii. A large-growing, handsome species, the leaves of which are deep green, and the midrib and nerves bright crimson. A native of Australia.

F. dealbata. A stout-growing, bushy plant, with leaves from 10 to 12 inches long, green above, silvery-white beneath. From Peru.

F. eburnea. This comes from the East Indies; its leaves are from 14 to 18 inches in length by 8 or 10 inches in width, oblong-elliptic in shape.

F. elastica. An Indian species that thrives much the quickest in stove heat, but will live and grow in a temperature little above that of a greenhouse. Its bold, glossy leaves and vigorous constitution are well known; it is one of the best room plants in cultivation.

F. elegans. This species has large leaves, cordate-ovate, 20 inches or more in length; the young shoots and petioles are covered with a downy coat, not unlike that of some Rhopalas. A native of Java.

F. exsculpata. This has elegant leaves with prominent lobes, the divisions being deeply cut so as to give the plant an appearance like that of some of the denser fronded Ferns. It comes from the South Sea Islands.

F. Parcellii. This is a very distinct species from the South Sea Islands; it is a free grower; the leaves are handsomely variegated, dark green and white.

F. Porteana. A stately species, with deep green, thick, glossy leaves of large size. Philippine Islands.

Insects.—Few insects affect these plants so as to give much trouble; the syringing to which they are subjected during the growing season is generally sufficient to keep them clean. When anything further is required, syringe freely with, or dip the plants in, insecticide.

FICUS.

(Greenhouse.)

The two forms of creeping Ficus, F. repens and F. repens minima, are often used as greenhouse climbers with good effect for covering walls, for which purpose they are well adapted by their close climbing habit and compact foliage.

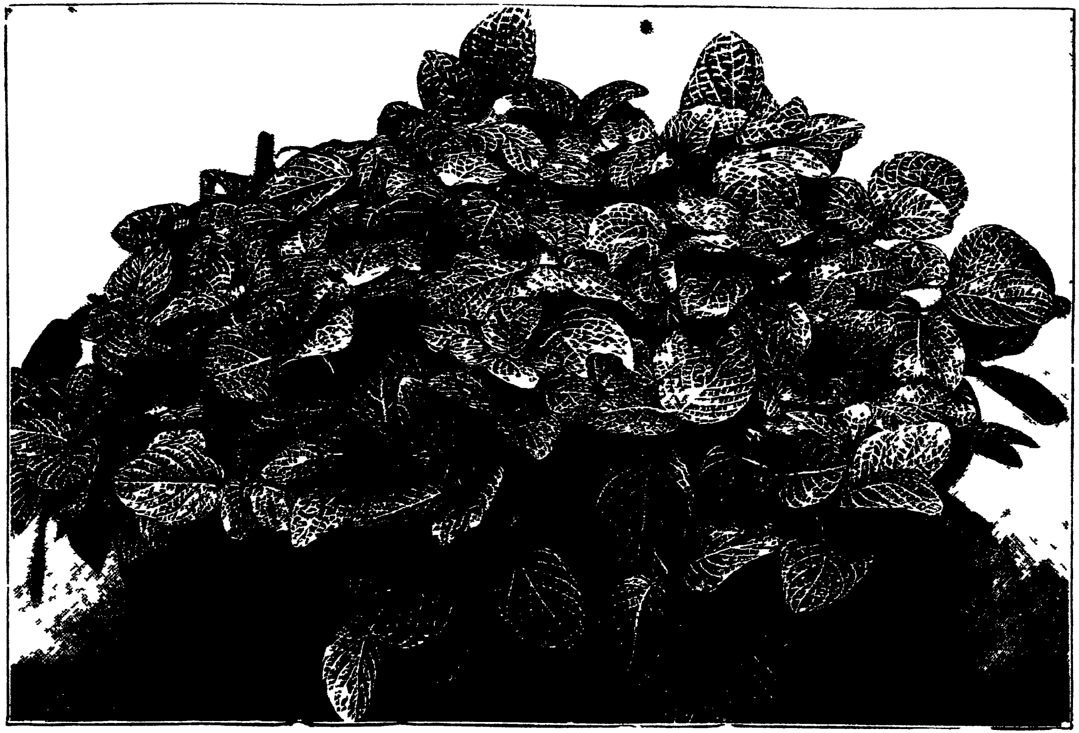
Their propagation is of the easiest possible description; they will strike from shoot-cuttings at any time of the year, in a little warmth, in sand and loam or peat; when they are rooted give larger pots, or at once plant them out where they are to be grown. The flowers are insignificant. They come from India.

INSECTS.—Aphides sometimes affect the young shoots, for which fumigate. If troubled with scale syringe when at rest with insecticide.

FITTONIA.

These are evergreen stove herbaceous plants of dwarf habit, with compact foliage covered with a beautiful variegated netted venation, that stands out prominently from the ground colour of the leaves, which in some of the kinds is bright green, in others of a dark reddish-brown hue. The plants have succulent stems that root freely, as they spread on the surface, into any loose or earthy matter within their reach; for this reason they are most useful for clothing the surface of stages and inside borders of warm plant-houses, to effect which nothing further is required than to prepare a few inches of the top with loose material, such as a mixture of peat or loam with a little leaf-mould and plenty of sand to keep it open. This should be done in spring just as growth commences, after which the young plants should be transferred to the spaces prepared for them; they may consist of crowns with three or four joints each that have been struck in the ordinary way by putting them a few inches apart in large pans filled with sand, kept moist and close for a week or two.

Fittonias are very useful for filling hanging baskets, or for covering the surface, both top and bottom, of baskets containing other plants, as they will root and thrive in the Moss that is generally used for lining the baskets if this is only kept moist, for it is well to observe that they require a continually moist medium for their roots. They also look well grown in large pans and allowed to hang over the sides, covering the whole with a dense growth of their exceedingly pretty leaves.



FITTONIA ARGYRONEURA

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So free is their growth that they will thrive in places where there is much less light than most plants will succeed with. When they get too high or at all straggling they may be cut in, and they will then break out again, or the space may be filled with fresh plants. All the Fittonias succeed best in a warm, moist atmosphere such as will answer for most warm stove plants, with shade when the weather is sunny.

The following are deserving of cultivation:—

F. argyroneura. Ground colour pale green, profusely netted with silvery-white nerves. A native of Peru.

F. gigantea. A strong-growing plant, the leaves of which are dark green, prettily veined with red. From Ecuador.

F. rubro-nervia. Medium-sized oval leaves, beautifully veined with reddish pink, a charming species. From Peru.

F. Verschaffeltii. Leaves deep green, with red veining. Brazil.

INSECTS.—Fittonias are easily kept free from the smaller insects that affect plants in heat by constant syringing, in which way the water they require can in a great measure be given. If mealy bug attacks them, syringe freely with tepid water and sponge the leaves afterwards.

FRANCISCEA.

Franciscéas rank amongst the finest and most distinct of flowering stove plants. They vary considerably in size, from the small, moderately compact, upright-habited F. Hopeana to the broad laurel-leaved F. confertiflora, which, when well grown, attains a height of 4 or 5 feet, and a diameter of 3 or 4 feet; its ample dark green glossy leaves form a perfect background to its large purple flowers, deep in colour when first opened, but, like those of most of the other species, turning gradually paler as they get older, until they assume almost a white shade. F. confertiflora is undoubtedly the finest representative of the genus, taking all its properties into account, although it is eclipsed in size of flower by the largest form of F. calycina called F. calycina major, but neither this nor the smaller form retains its leaves so well as F. confertiflora, nor do they grow so freely. The beauty of the flowers of most of the species is much increased by the white ring round the mouth of the tube, which is most conspicuous when they first open, contrasting well with the intense colour of the newly-expanded blossoms. Another desirable property which they possess is that, in addition to opening their flowers in succession, the time of their flowering may be so regulated as to have a continuance for several months, extending from early spring until the summer is far advanced. This much increases their value for exhibition purposes or for general decoration, for which latter they are invaluable, as they will stand in a conservatory when in flower in summer. There is one thing in which several of the species, more particularly F. confertiflora, differ from most plants, and that is that, although they need a moderate heat to grow well, they will open their flowers freely and much finer in colour in a cool house and when closely shaded than they do in heat. This is the more remarkable as it is completely at variance with the requirements of the greater number of plants. There are one or two matters peculiar to their cultivation which it is essential not to lose sight of. First, at no season, either when making their growth or even when it is completed and the wood and leaves are fully matured, can they bear the effects of the direct action of the sun, or the deep glossy green of their leaves will be quickly converted into a dingy brown, sickly hue. When in flower, too, the colour of the blooms becomes bleached in a day or two if the sun is allowed to shine upon them. The second and equally important point is that they should at all times be kept free from insects—especially that worst of all pests, mealy bug, which if present is sure to get the plants into bad condition, for not only do the flower-buds get injured by the operation of cleaning and fall off, but the leaves also suffer. Other insects will live on Franciscéas, but none else are so injurious.

All Franciscéas are easily propagated by means of cuttings made of the half-ripened wood, which may generally be obtained by the end of March from plants that have made early growth in the stove. Bits of the leading shoots about 4 inches or 5 inches in length, inserted in small pots filled with sand, placed in a temperature of 70°, covered with propagating glasses and shaded, root in a few weeks, after which the glasses should be removed. Put them where they will receive plenty of light, but be shaded from the sun. As soon as the cuttings have filled their little pots with roots they should be removed into others 4 inches or 5 inches in diameter. They will all grow in either peat or loam or a mixture of both; but, like most evergreen plants with large leaves, they grow freest in peat, which gives the deep green colour to the leaves so desirable. In peat they make stronger shoots, and these, in the case of Franciscéas, always produce the most flowers. The peat should be of good quality, containing plenty of undecomposed vegetable fibre. For the first potting, break the soil into bits the size of acorns, and add one-sixth of clean sand; drain the pots sufficiently, and press the soil moderately firm. Pinch out the points, at the same time bending the leading shoot down in a horizontal position, which will cause more of the latent back-buds to break than would otherwise happen if the principal growth was allowed to remain upright. They will grow in an intermediate temperature, but make more progress if kept through the summer at 70° during the night, with 10° or 15° higher in the day-time. Do not allow the shading to remain over them when the sun is not out; for although, as already stated, they cannot bear direct sunshine, the leaves, if grown with insufficient light, will be soft and deficient in substance, light being indispensable to vigorous health. Give air in the early part of the day, but close sufficiently soon to cause the temperature to rise for an hour or two up to 90°, syringing overhead at the same time. They are free-rooting subjects, and by the middle of July will require another shift, into pots 3 inches larger; at the same time pinch out the points of the shoots and tie them out so as to keep the plants open; in other respects treat them as before, and supply them with plenty of water at the roots. By the beginning of September they should have more air, and the shading be decreased but not altogether dispensed with until the sun has less power. Though the different species will through the winter do with a temperature of from 45° to 50°, it will, in the early stages of their growth, be advisable to keep them warmer, as the object will be to get them on in size. A temperature of 55° will be a suitable heat for them until the end of February, when it may be raised 5°. In March again give them a shift into pots from 4 inches to 6 inches larger, according to the kinds, the smaller varieties, such as F. Hopeana, F. eximia, and F. Lindenii not requiring nearly so much room as the stronger-growing F. confertiflora and F. calycina. A 12-inch or 13-inch pot is large enough for a full-grown specimen of F. Hopeana, which is the smallest; whereas F. confertiflora, when at its full size, will need one 16 inches or 18 inches in diameter. In other respects, as to soil, temperature, shade, and moisture, similar treatment will answer for all. Again pinch the points of the shoots, tying them out, so as to well furnish the base of the plants down to the rims of the pots. As the season advances increase the temperature as before, and give shade, air, and moisture as in the preceding summer. By the middle of June they will again require stopping, after which the treatment will be of a routine description. They will make good decorative plants the coming spring, and to afford a succession it will be necessary to make a difference in the time during which some are allowed to remain in heat after the last stopping. As soon as the shoots have attained their full length, which may be looked for in September, a portion of the plants ought to be at once moved to a cool house, where they should have a moderate amount of air, but be slightly shaded when the sun is bright, as even at this time of the year, when its power is fast waning, the leaves will be much better not exposed to its full influence. The remaining portion of the plants may be allowed to remain in heat some weeks longer until the flower-buds are quite visible, when they also should be moved to cooler quarters; give them less water, but at no time must they be kept so dry as many things require to be, or the large-leaved ones will be found to flag when air is given them, and the foliage will be injured. They should be kept through the winter at from 45° to 50°. A lower temperature than this they do not like, and anything above it will bring them into flower too early in the spring. The plants that were allowed to stay the longest in heat until their bloom-buds were formed will go on increasing them in size during the winter, and will flower the earliest, the time being easily regulated by giving them more or less warmth. Those that were first taken out of heat will make little progress until the days begin to lengthen, when the increased solar warmth will cause the buds to swell. They will keep gradually, but slowly, increasing in size until they expand. Plants thus managed may be kept, placed in a north house at the end of April, to bloom in July; in all cases shading when the sun is bright, even as early as the beginning of March. In their ability thus to set flowers in a lower temperature than that in which they have been grown they differ from most plants. After blooming they should have their shoots cut back, so as to keep them bushy. If not shortened in each season before they are started into growth, they would soon get into a loose, straggling condition. Again place them in heat; although they do not require it, they will while growing bear as high a temperature as most plants. As soon as they have broken into growth they will require repotting; give a shift proportionate to the condition of the plants and the size and strength of the species grown. From this time forward they will not need much, if any, stopping, except in the case of such as have bloomed early in the spring, and in other respects they should be managed as in the past season. If kept free from insects and fairly treated they will last for a number of years, assisted during the growing season with a regular supply of manure-water. When they get into pots as large as it is desirable to put them, and the soil in these is exhausted, they may be headed back to half their size, and, when they have broken, be turned out of the pots, have the old soil removed, and placed in smaller ones. Thus treated, they can be furnished with strong flowering shoots, even superior to what they possessed in the early stages of their existence.

The undermentioned sorts are all deserving of cultivation :—

F. acuminata. An old, but handsome kind, distinct in appearance. The flowers are purple. A native of Rio de Janeiro.

F. confertiflora. A free, dense-growing species, one of the finest exhibition plants in existence, and suitable for conservatory decoration, the deep purple colour harmonising well with that of almost any other flower. It comes from Brazil.

F. confertiflora variegata. A form of the preceding, with leaves prettily variegated with white. The flowers are in no way different from those of the original species.

F. calycina major. This is a large-flowering, strong-wooded kind, with ample leaves and very large deep-coloured flowers; the latter are not produced in such numbers as in the case of F. confertiflora, but, nevertheless, it is a splendid sort. From Brazil.

F. eximia. A somewhat erect-habited plant of moderate growth, producing large heads of purple flowers. Also a native of Brazil.

F. Hopeana (uniflora). A small-growing species that produces its flowers freely from short spurs up the branches, as well as from the points of the shoots and axils of the leaves. The colour is pale purple or lilac, changing to white. Brazil.

F. Lindenii. A smallish-growing species, with dull-coloured leaves and very bright purplish flowers. A very desirable plant for general decorative purposes, not so well known or so extensively grown as it deserves to be. Brazil.

INSECTS.—Thrips, red spider, and green-fly will sometimes make their appearance upon Franciseeas, but, from the repeated use of the syringe during the growing season, they do not often become very troublesome. Copious syringing and fumigation will be found sufficient to destroy these pests. Should mealy bug and scale appear they should have no quarter, or they will, if allowed to get numerous, reduce the plants to a condition that precludes the possibility of their flowering satisfactorily. They must be diligently sought after during the growing season, and the sponge and a soft brush used for their destruction, and when the plants are at rest give repeated washings, syringings, and dippings with some insecticide.

FRANCOA.

These are herbaceous plants, natives of Chili ; they are nearly hardy, and do well in a cool greenhouse. Although they have been long known in this country, they are not so numerous as their merits entitle them to be. F. ramosa is particularly valuable, for where a sufficient quantity of this kind is grown to admit of its being freely used, its tall, slender flower-stems produce a telling effect. Francoas are propagated from seeds. They can be sown at different times, from February to midsummer, but the earlier period will usually be found the best, as then the seedlings have all the season before them to attain strength : the seed should be sown in a well-drained pan filled with sifted peat, to which enough sand has been added to keep it open. Press the soil down smooth, do not sow the seeds too thickly, and only just cover them with a little of the finest soil. Before sowing see that the material is moist enough without being too wet. Put a sheet of glass over the top—this will keep the surface damp and so prevent the necessity for giving much water until the seeds have vegetated ; stand the pan in a temperature of 50°, which will be quite warm enough. As soon as the seedlings make their appearance dispense with the glass over the pan, give water as required, and stand the plants where they will get a fair amount of light. When they are big enough to handle prick them out 2 inches apart in large pans of well-prepared soil—either peat or good loam will answer; if the latter is used add as well as some sand one-sixth of leaf-mould. They will get on faster for a time this way in pans than if put at once into little pots, on account of the soil being more easily kept in right condition as to water. By the end of May remove them to a greenhouse, or frame, keeping them moderately moist, and giving air daily. Before the leaves get crowded put the little plants singly into 4 or 5 inch pots, and encourage them to make growth. Some of the strongest will most likely want to produce flower-spikes towards the end of summer, and if flowers are needed they may be allowed to bloom; but if the object is to get the plants as strong as possible the second year, it is well to pinch them out. If, before the autumn is too far advanced, any seem to be short of room, give them pots an inch or two larger, and encourage them to root into the new soil before winter, during which season they will do anywhere out of the reach of frost; keep them a little drier at the roots through the dormant time. In the spring those that were not potted in the autumn must be shifted, the size of the pots being regulated by the strength of the plants. This season they may be expected to bloom well. At the time the flower-spikes are about to make their appearance they are much strengthened by weak manure-water once a week.

F. appendiculata. Bears reddish-crimson flowers, and makes an effective pot plant.

F. ramosa. This is the best known, and may be looked upon as the handsomest and most useful kind; its pretty white flowers stand conspicuous among anything else with which they are associated.

INSECTS.—For aphides, which are sometimes troublesome on these plants, fumigate.

FUCHSIA.

The combination of good properties which the family of Fuchsias possess is so well known that it is needless to say anything here in their favour. Much has been done in raising seedling varieties, by which the size and colour of the flowers, and the general habit of the plants, have been greatly improved.

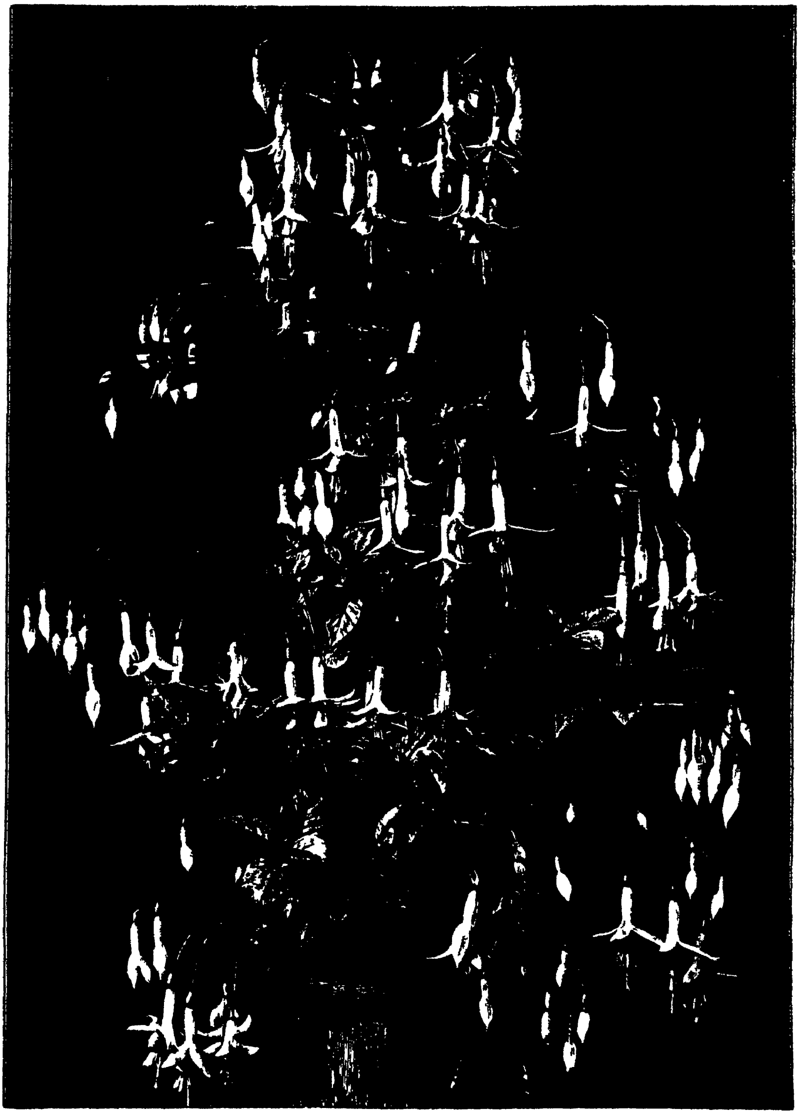
They are among the easiest of greenhouse plants to propagate, and their after growth is no more difficult. Cuttings will strike at any time of the year when soft shoots that have not formed flowers can be had. The principal thing to be kept in view is the necessity for getting the plants well on in size early in spring, as the natural disposition to bloom when the summer season approaches is such that they make much less progress afterwards. To obtain moderate-sized examples that will come into flower as the spring gets advanced, and in summer, the cuttings should be struck in the first months of the year, say at the beginning of February; for this purpose old plants, of the sorts to be increased, should be placed in an intermediate heat at the latter end of December; here they will break into growth immediately. When the young shoots are 2 or 3 inches long take them off and insert half-a-dozen together in 6-inch pots filled with sand; stand in a temperature of 65°, keep them moist and close, and they will root in a fortnight, after which let them have the full air of the house; move singly into 3-inch pots in good turfy loam, broken fine, to which add some rotten manure, leaf mould, and sand. As soon as they begin to grow stand close to the glass, and keep the night temperature now about 60°, with a little more in the day; syringe overhead in the afternoons and let the atmosphere be moderately moist. As the sun's power increases give a little shade in the middle of the day, syringing overhead in the afternoons; the plants will now grow apace. Varieties that do not branch freely should have the points of the leading shoots pinched out, but many of the sorts now grown will make side-growths sufficient without stopping. When the roots get well hold of the new soil move into pots 4 or 5 inches larger, and let the soil now be more lumpy, but well enriched, and make it firm in the pots. Treat as before in the matter of moisture, admitting more air as the spring advances, and continuing to shade when necessary. Each plant should now have a stick for support; if the object is to grow all or any part of the stock larger, they must again be moved, this time into pots from 10 to 12 inches in diameter; stop the points of all the shoots, including the leader, and continue to treat generally as before. Plants so managed may be expected to flower profusely in July, and through the following months; such as were let to bloom in the second pots they were moved to from the cutting state will bloom in May. In all cases their flowering may be prolonged by the use of manure-water, given in a weak state, if too strong it will cause the flower-buds to fall off. Where very large specimens are required it is best to strike the cuttings about August, to keep them growing slowly through the winter, and to pot on as advised for the winter-struck stock.

Old plants with the branches cut back freely early in spring, put in a little warmth, and just as they have broken shaken out of the old soil and repotted in new, treated afterwards as recommended for the younger stock, will make large specimens that will bloom well. In this way they can be made to do duty for several years, but young plants are better furnished, and have a nicer appearance.

The undermentioned is a good selection:—

SINGLE DARK VARIETIES.

F. Covent Garden Scarlet.



FUCHSIA.

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F. Earl of Beaconsfield.
F. Eclipse.
F. Enoch Arden.
F. Gaspar.
F. Lord Derby.
F. Sir W. G. Armstrong
F. Swanley Gem.
F. Try me O.
F. Wave of Life.

SINGLE LIGHT VARIETIES.

F. Arabella.
F. Covent Garden White.
F. Evening Star.
F. Guiding Star.
F. Lady Heytesbury.
F. Lustre.
F. Maid of Honour.
F. marginata.
F. Minnie Banks.
F. Rose of Castile.

VARIETIES WITH WHITE COROLLAS.

F. Avalanche. (Smith) Double.
F. Cannell's Gem. Single.
F. Delight. Single.
F. Jeanne d'Arc. Single.
F. Kingsburyana. Double.
F. Miss Lucy Finnis. Double.
F. Mrs. E. Bennett. Single.
F. Mrs. H. Cannell. Double.

DOUBLE DARK VARIETIES.

F. Alpha.
F. Avalanche. (Henderson.)
F. Depute Berlet.
F. Harvest Home.
F. King of the doubles.
F. Nestor.
F. Sir Garnet Wolseley.
F. Tower of London.

The following species, and distinct hybrids, are handsome kinds:—

F. Corallina.
F. corymbiflora.
F. corymbiflora alba.
F. Dominiana.
F. procumbens.
F. splendens.

INSECTS.—Fuchsias are much subject to the attacks of both red spider and aphides; for the former syringe continually through the growing season; for aphides, fumigate with tobacco, repeating the application, but not severely, until the insects are destroyed.

GARDENIA.

Few stove plants are such general favourites as Gardenias, and few have so many properties calculated to render them generally useful. Considerable numbers of them come from China, the East and West Indies, South America, and one or two from Sierra Leone, of which the singular G. Stanleyana, so very unlike the generality of the other species, is a noteworthy example. With one or two exceptions, they are all evergreen shrubs, mostly possessing a dense, compact habit of growth. The species held in high estimation are comparatively few, but these few are deservedly prized for their exquisite fragrance, and for the freedom with which their blossoms are produced during a considerable portion of the year, especially in the spring, when sweet-scented flowers are scarce. They are also particularly well adapted for bouquets and the decoration of vases on account of their soft milky-white colour and agreeable perfume. The unopened buds and newly-expanded flowers of G. citriodora—quite distinct in appearance from the other members of the family—are largely used in place of Orange blossom, for which they form a by no means indifferent substitute. To have Gardenias in flower in winter the plants require to be prepared by well maturing their growth in autumn, but they should never be allowed to become quite dormant through want of warmth. They are easily grown, and are remarkably free bloomers, but there is one point in their cultivation that demands special notice, and that is that where required to be grown in anything approaching a condition that will fully exemplify their flowering capabilities, they must be kept free from the attacks of insects, such as mealy bug, a pest with which they are great favourites, and which, if once allowed to obtain a footing, will give an unlimited amount of trouble.

The propagation of Gardenias is easy if cuttings from half or fully ripened shoots are made in March, at which time they can be had in that condition from plants that have been kept in a brisk heat through the winter for early flowering; insert them singly in small pots drained and half filled with a mixture of equal parts of peat and sand, finishing off with fine sand and covering with a propagating glass. If placed in a temperature of 70° and kept moist they will root in a few weeks, when the glass may be removed. In May move them into 3 or 4 inch pots. They will grow in either peat or loam, but the former, where it can be had of a fibrous character, is best. If peat of a heavy close description only is obtainable, it is better to grow them in turfy loam; break the fibrous parts up into small pieces, and add one-sixth of rotten manure and as much sand as will keep the whole porous; in all stages of their existence this is necessary, as they require a plentiful supply of water when growing freely. Pot them firmly, and place them where they will receive plenty of light in a temperature of about 65° by night, allowing 10° or 15° more in the daytime. Give air as required in the early part of the day, and shade from the sun during bright weather. Close early in the afternoon, and syringe well overhead. As the shoots extend pinch out the points of the strongest, so as to cause them to break back; they will then grow rapidly and make roots fast. By the end of June the stronger growers will have filled their pots, and should be at once moved into others 2 or 3 inches larger. The treatment just given will apply to all the varieties hereafter recommended to be grown, except the small G. citriodora, for which 4 or 5 inch pots will be sufficient the first season. Let the soil now used be somewhat more lumpy, and add to it a proportion of rotten manure and sand similar to that previously employed.

After potting do not give quite so much water to the roots until they have fairly got hold of the new soil; pinch out the points of all the strongest shoots, and tie them down in a horizontal position, which will induce them to break back as well as push additional growth from the points; continue the treatment as already recommended, closing the house in the afternoons through July and August, so as to cause the temperature to rise for a couple of hours to 90°, and give liquid manure every other time they are watered. Managed thus, they will grow both vigorously and rapidly. At the beginning of September the temperature may be reduced a few degrees both by day and night; they may also have more air, shade being only needed in the middle of the day when the weather is very clear. None of the species require much support, but during the latter part of the summer it will be found advisable to apply a few sticks, so as to open out the shoots a little—treatment which will much assist them in ripening the wood and in inducing the formation of flower-buds; reduce the heat as the power of the sun declines, and for the two concluding months of the year they may be kept in a night temperature of 55° with 10° more warmth during the day; this will stop them from making much progress.

If required in flower early, a portion of the plants must be placed at the commencement of the year in a night temperature of 65°, with an increase of 5° in the daytime, keeping them near the glass and the soil moderately moist; this will soon induce the bloom-buds to swell, and they will then open in succession, those on the strongest leading shoots being the first. In cutting the flowers, no more of the wood than can be avoided should be taken, as generally from both sides of the bloom-buds they will push growth, which will set and produce a second crop of flowers. The same plants will keep on opening a succession of flowers for a considerable time, but others should be brought in at intervals to keep up the supply. Such as are wanted to bloom later on in the spring must be kept at a temperature similar to that recommended for the end of the year until the days begin to lengthen in March. They may then be placed where they will receive an increase of heat similar to that suggested for the early flowering portion. As they go out of bloom, both those that flowered early and those that bloomed latest ought to be well cut back, and if they have any insects upon them they should, when thus denuded of soft growth, be thoroughly washed with or dipped in some insecticide strong enough to kill both the full-grown insects and their eggs. This washing may with advantage be repeated two or three times in the course of a fortnight before they have commenced to make fresh growth, and they should be kept in a temperature sufficiently high to push them on. As soon as they have broken freely turn them out of their pots and remove as much soil from the balls as can be taken away without destroying many roots. Give a 4 or 6 inch shift, according to the size required, increasing the temperature as the season advances, shading when needful, and giving air and syringing daily as in the preceding summer. When the pots get filled with roots manure-water must be liberally supplied, and any shoots that take an undue lead should be shortened. They will not require stopping this season, as they are naturally of a bushy habit, and if the shoots are kept tied out they will generally break of their own accord as well as push up numbers of strong growths from the bottom. In the autumn, as before, keep them drier, and discontinue both the use of the syringe and shading, giving more air and less heat, and wintering as previously advised. After flowering they may again be cut back, the soil partially removed, and new material substituted, using larger pots; if smaller plants are considered preferable, the old ones may be destroyed and others of less size selected; but to accomplish this fresh stock should be struck each year and grown on as already recommended.

The following kinds are all good and well deserve attention:—

G. citriodora. A dwarf-growing plant, with much smaller flowers than any of the others; a desirable sort for either large or small collections. A native of Natal.

G. florida. A pretty kind with medium-sized white flowers, very sweet scented. Japan.

G. Fortunei. A strong-growing kind from China, the flowers of which are proportionately larger than those of the above.

G. intermedia. For ordinary purposes this may be considered the best of all Gardenias. The flowers when first opened are milk-white, turning yellow as they get older. It is good in foliage and a free grower and flowerer.

G. intermedia variegata. A variegated form of the preceding in which the leaves are prettily marked; flowers the same as those of the green sort.

G. radicans. A low-growing compact kind, with small leaves, bearing very pretty highly-perfumed flowers, white when first open, but turning pale yellow as they get older; a native of China.

G. radicans major. A larger and stronger-growing variety than the preceding.

G. Stanleyana. A remarkable plant, very distinct from all others. It attains a considerable size, and the branches assume a flat horizontal position. Its singular-shaped, white, purple-spotted flowers are produced on the upper sides of the shoots, and stand above the leaves. Anyone requiring a very distinct flowering plant, differing from anything else in general cultivation, will not be disappointed with this. From Sierra Leone.

INSECTS.—As regards insects, Gardenias as already said are particularly subject to the attacks of scale and mealy bug, which must be diligently sought for during the growing season and destroyed by sponge and brush, and also by washing with insecticide, which, however, it is not safe to use after the flower-buds are formed. If thrips or aphides make their appearance they are best destroyed by fumigation. Red spider is rarely troublesome, the continued syringing needed during the growing season generally keeping it in check.

GARDOQUIA.

This is a small genus of greenhouse plants, indigenous to the cool parts of South America. They are now seldom met with in cultivation, being of comparatively little decorative value. Except that they are more tender, they succeed under conditions such as advised for Myrtles, which see.

The undermentioned are the best kinds:—

G. Gilliesii. An evergreen species with lilac flowers. From Chili.

G. Hookeri. Also an evergreen, bearing scarlet flowers. A native of Carolina.

G. multiflora. Flowers purple, evergreen. From Chili.

All the above are summer bloomers.

GASTROLOBIUM.

Most of the species of Gastrolobium are found in the Swan River district. They are slender low-growing evergreen greenhouse shrubs, with pretty yellow or yellow and red flowers, but are not effective enough to admit of their being classed as more than second-rate. Their method of propagation and general treatment is similar to that which answers for Chorozemas, which see.

The undermentioned are held in most estimation:—

G. Drummondii.
G. Hendersonii.
G. Leakeanum.
G. trilobum.

GASTRONEMA.

These are evergreen greenhouse bulbous plants that have pretty flowers. Their mode of propagation is by offsets like Amaryllis, and their general treatment is similar to that advised for Vallota purpurea, which see.

The species in cultivation are few.

G. clavatum. Flowers white. A native of the Cape of Good Hope.

G. sanguineum. Has red flowers. It comes from Caffraria.

GEONOMA.

A genus of handsome Palms, some of which are so distinct and beautiful as to deserve being included in the most select company in the stove, as unfortunately they require a brisk heat to keep them in good condition.

For propagation and cultivation, see Palms, general details of culture.

G. elegans. A slender-growing species, the leaf-blade is bifid and entire, except near the base, where it is divided into several pinnæ. From Brazil.

G. gracilis. A small-growing species, with pinnate leaves, which droop much, giving the plant a graceful appearance. Costa Rica.

G. Seemanni. This handsome plant seems to be a fine variety of G. Martiana;

it is a distinct and desirable kind, and does not take up too much room. The stem is of moderate strength, the leaf-blade large, plaited and entire, bifid at the extremity, presenting a perfect contrast to the pinnate-leaved species. Central America.

G. Verschaffeltii. A handsome kind, with moderate-sized leaves, sufficiently distinct in form from the species before named. It comes from South America.

GESNERA.

The species of Gesnera generally cultivated are mostly tuberous-rooted plants, but others are also grown. The greater portion of them are indigenous to Brazil and the South American continent, consequently they are stove plants, and a considerable amount of warmth is necessary in order to grow them successfully. Some, like G. Cooperii, bear a profusion of intensely vivid scarlet flowers, which remain long in perfection; others, of which G. zebrina may be taken as a type, possess, in addition to handsome red and yellow flowers, exquisitely beautiful leaves, the upper surface of which is clothed with reddish hairs, thus giving it a soft velvet-like appearance. The moderate size which Gesneras attain, and their naturally free growth, render them well worth a place amongst the most easily managed of stove plants.

The tuberous species may be propagated at different times of the year, according to the early or late period at which they are started into growth. The most satisfactory method of propagation is by means of cuttings made from the young shoots, which spring freely from the crown, as in the case of Gloxinias. Supposing the plants, after blooming in summer, to have been gradually dried off, they should, at the beginning of the year, be placed in a moist stove, with a temperature of 60° in the night, and a rise of 10° by day, giving just as much water as will slightly moisten the soil; thus treated they will soon commence to grow. When the shoots have attained a length of about 2 inches they may be taken off immediately under the first joint, and the leaves removed therefrom; put them in a well-drained pan in which is placed a little fine sandy soil, filling up with silver sand. Insert the cuttings sufficiently far apart to prevent crowding; give a little water, and cover with a bell-glass. If bottom heat can be supplied they will root quicker. As they strike readily they will, in the course of a few weeks, have rooted sufficiently to bear moving into small pots, which must be well drained and filled with a mixture of sifted loam, to which has been added one-fourth of sifted leaf-mould, and as much sand as will give porosity to the whole; water slightly, and again partially cover for a few days with glasses, or put them in a propagating frame, to which admit air gradually, and, as soon as they give evidence of making growth, inure them by degrees to the full air of the house. In the course of six or eight weeks they will have made considerable progress, and will require removal into pots 4 or 5 inches in diameter, in soil of a character similar to that employed for the first potting, but in a rougher and more lumpy condition. Through the summer subject them to an ordinary stove temperature, with sufficient air during the day. Keep them near the glass where they will receive plenty of light, but they should have a little shade in the middle of the day during bright weather. A neat stick to each will be necessary to support the shoot. Stopping should be avoided, as the object this first season is to encourage all the leaf-growth possible, upon which will depend the size and strength which the tubers will attain. From their natural free habit of flowering the strongest plants will very likely form flower-spikes towards the end of summer; but as the object is, as has just been stated, to get as much strength as possible into the tubers, we should recommend the bloom being pinched out, as, if allowed to go on, it will considerably restrict the growth of the plants. All through the season they must be attentively watered at the roots and syringed overhead in the afternoons when the house is closed. Keep the soil sufficiently moist so long as they evince a disposition to grow, after which cease syringing, give less shade, but do not allow the soil to become dry so long as the leaves retain full vitality. When they begin to show signs of going to rest gradually withhold water until the tops are dead, when the soil should be allowed to become almost quite dry. The pots should now be placed on a shelf or in some position at the coolest end of the stove, where they will be secure from drip from the roof or from water running from other plants. We mention this, for it is a common occurrence to see tubers of these and other plants when at rest put under stages or on damp floors from which they either absorb moisture, or receive that which drips from above, by which means the soil, instead of being all but dry, is so wet that it either causes decay or prematurely starts them into growth. They must not moreover, be subjected to too low a temperature when at rest or the tubers will rot. From 50° to 55° at night is as low as they can safely be kept. Early in the ensuing year the old soil should be shaken from them, and they should be shifted into pots proportionate in size to that which the tubers have attained. Those that have done well will bear moving at once into pots 6 or 7 inches in diameter; a size less will do for the smaller roots. Drain and fill the pots with soil such as that recommended for the preceding year; the more fibrous material it contains the freer will the growth of the plants be. Always place the potting material before use where it will get a little warm; let it be in rather a dry than in a moist state. It often happens with these, and tubers of a similar character, that they are suddenly transferred from the dry soil in which they have been at rest to new soil that contains too much moisture, from which they absorb so much as to cause their destruction.

In potting allow the tops of the tubers to be just above the surface of the soil, and press the latter moderately firm; place them on a shelf in a house or pit where the temperature will be 60° during the night, with a proportionate rise in the daytime. Give water enough to fairly moisten the soil directly the tubers begin to push. It is important that they have sufficient light as soon as shoot-growth commences, for if their first efforts in this direction are made in a dark situation the shoots quickly become drawn up weak, a condition that no subsequent treatment during the season can rectify. As solar heat increases give more warmth both day and night. The time of their blooming will vary with the higher or lower temperature to which they are subjected, but they may be expected to show flower in April or May. When the bloom spikes appear see that they do not receive too much wet through syringing in the after-part of the day, as wet often causes the individual unexpanded flowers to drop. When the flowers begin to open the plants may be placed in a somewhat cooler situation, such as an intermediate house or a warm conservatory away from draughts; keep the soil while they are in a position of this kind a little drier than hitherto, but on no account must they be placed where too cold, or they will receive a check that will endanger their health and cause the blooms to fall off prematurely. If used for decorative purposes in this way they should, as soon as the flowering is over, be at once moved back to the stove and regularly supplied with water until they exhibit signs of going to rest. If, on the other hand, they are not removed during the time of flowering from the stove, plants that are started early in the year, as these were, will generally push up a successional crop of young shoots, much in the way that Gloxinias do, which will bloom later in the season. During this second growth, weak applications of manure-water will materially assist them. Through the autumn give more air and subject them to a drier atmosphere until the tops have died down; winter as before. By retarding growth until late in the spring they may be had in bloom through the autumn if required. The flowers can be used for cutting, but they are better adapted for decorative purposes on the plants. If carefully managed the tubers go on increasing in size, and will last for many years. This class of Gesneras may also be increased by division of the tubers.

The ornamental-leaved kinds, which also produce beautiful flowers, are mostly herbaceous, and have scaly roots not unlike those of the nearly allied genus Achimenes. They will strike from cuttings made of the young shoots, either consisting of the top and two or three joints, or of a couple or even of a single joint from the lower portion of the shoots, when not too hard or woody, inserted in silver sand, and covered with a propagating glass; for the most part they are, however, usually increased by division of their scale-like roots, which they form in considerable numbers. These may either be used whole or cut into pieces, according to the scarcity of the kinds or the quantity required; but, although a small piece, with care, will grow, still, as might be naturally supposed, the larger the pieces the stronger the plants will be. For ordinary purposes the roots used whole are best. As this very beautiful section of Gesneras is the most useful when in flower through the late and earliest months of the year, it is not wise to start the plants too soon; April will be time enough. The most convenient practice is to procure some good-sized propagating pans, drained and two-thirds filled with sifted soil made sufficiently light by the addition of a little leaf-mould and sand. Gently press the surface smooth; on this lay the roots 2 inches apart and cover with half-an-inch of similar material. At once place them in a night temperature of 60° or 65°, keeping the soil only slightly moist until they have begun to grow. As soon as the young shoots have pushed up an inch above the surface move them singly into from 3 to 5 inch pots, according to the strength of the roots, using soil a little coarser than that in which they were started. With this section it is even more important than with the first-mentioned to keep them near the light, as the general appearance of the plants is quite as much a matter of consideration as are the flowers they ultimately bear; unless all their leaves are retained in a fresh, healthy condition until the blooming is finished half their beauty is lost, and this is not possible if the leaf-development takes place under insufficient light. They require shade when the sun is bright, otherwise the leaves do not attain their wonted lustre. Increase the temperature as the days lengthen, apply water to the roots regularly, and syringe overhead in the afternoons. By July the strongest plants may be moved into 6 or 7 inch pots, the weaker ones receiving proportionately less room; or two or three of these may be put in a pot of the larger size, but when sufficiently strong they look best grown singly. They will need a thin stick to each shoot to keep them in an erect position. As autumn advances cease shading and the use of the syringe, and gradually decrease the heat, but this should not be reduced lower than that in which they were first started. Their time of blooming will be regulated in a great measure by the heat in which they are kept through the winter; in an ordinary stove they will be in flower during December, January, and February, and where wanted later it is well to start a few bulbs after the time advised the preceding spring. When the flowering is over, dry them off and store them where they will be neither too cold nor so warm as to cause them to push before they are required. If room is an object, the roots may be shaken out of the soil and placed in paper bags in a little dry sand.

Among a number of fine kinds the following are especially deserving of cultivation:—

G. albo-lutescens grandiflora. A handsome and distinct kind, with delicate creamy white flowers that contrast well with the higher shaded sorts.

G. Barlowii. A medium-habited sort, with stout leaves and large spikes of flowers.

G. cinnabarina. A red-flowered, stout-growing Mexican kind that blooms freely.

G. Cooperii. A large tuberous Brazilian species which, when in strong condition, produces a number of flower-stems that bear stout spikes of rich scarlet bloom.

G. Dauw. A handsome variety, flowers white, rose, and yellow.

G. Donckelaarii. Also an erect-habited Columbian sort, with deep crimson flowers.

G. exoniensis. A remarkably handsome sort, the leaves of which are beautifully coloured, and in texture as lustrous as velvet.

G. *fulgida bicolor.* Flowers vermilion, spotted with white beneath.

G. gloxiniæflora. So named on account of its beautiful Gloxinia-shaped flowers; it is a handsome, but by no means common plant.

G. ignea. A garden hybrid, with vivid crimson blooms that are very handsome.

G. Infanta. Tube light rose, yellow within, tinged with blush.

G. Leopoldi lilacina. A very distinct kind, the flowers of which have a lilac shade; a desirable sort.

G. magnifica. One of the finest; flowers deep scarlet.

G. tubiflora. A South American species, with long tube-shaped scarlet flowers.

G. zebrina. This Brazilian species belongs to the scaly-rooted kinds that have such conspicuously handsome leaves, which, independently of the flowers, add much to the beauty of the plants; the flowers are produced in long erect panicles, and are scarlet and yellow.

INSECTS.—The continuous syringing needed when the plants are in active growth is generally sufficient to keep down red spider, thrips, and aphides, but, should the latter appear, fumigate. They must be carefully guarded from the attacks of mealy bug, for, if this gain a footing on the fine-leaved kinds, the sponging and brushing necessary for its removal almost destroys the beauty of the plants.

GLEICHENIA.

The species included in this genus of Ferns, which comprises both stove and greenhouse kinds, are not numerous, but they are extremely beautiful. Their elegantly divided fronds are conspicuous, not alone among Ferns, but among all other plants as well. Most of the favourite sorts come from New Holland, and adjacent parts. Their creeping stems spread rapidly if allowed space in which to push their roots. In propagating Gleichenias care should be taken not to divide them into too small pieces—each piece intended to form a plant should have a good portion of roots attached. They do better kept a little warmer than in a greenhouse, and do not like too much moisture in the atmosphere or being syringed overhead; they must also be kept perfectly free from scale insects, or it is impossible to grow them to any considerable size, as the sponging and brushing necessary to keep down the insects spoils the appearance of the plants.

For propagation and cultivation, see Ferns, general details of culture.

STOVE SPECIES.

G. dichotoma. The Tropics.
G. furcata. West Indies.
G. pectinata. West Indies.

GREENHOUSE SPECIES.

G. circinata glauca. New Zealand.
G. dicarpa longipinnata. Tasmania.
G. flabellata. Australia.
G. hecistophylla. New Zealand.
G. Mendelii. Australia.
G. microphylla. New Holland.
G. rupestris glaucescens. New South Wales.
G. semi-vestita. New Caledonia.
G. Speluncæ. New South Wales.

GLORIOSA.

These consist of a limited number of stove bulbous plants which bear handsome, distinct, and somewhat singular-looking flowers. They are deciduous, the stems dying down gradually in autumn after flowering, which they generally do in July and August, a time when, there being usually a comparative scarcity of flowers, they are more useful for conservatory decoration than they would be at any other season. The peculiar character of their blooms befits them for association with either fine-leaved or ordinary flowering plants. They are especially adapted for cultivation by those who have not a large amount of stove room, as their roots can be stowed away in winter so as to occupy no more space than those of Gloxinias and similar plants, and they are likewise well suited for purposes of exhibition. They are easily managed, and require no special treatment to ensure their growing and flowering abundantly.

They may be increased by division of the roots in spring, just as they have started into growth, in the same manner as Gloxinias, cutting through the crown with a sharp knife so as to secure to each piece thus divided a bud or shoot. When raised from seeds they should be sown in March, in the stove, in small well-drained pots filled with equal parts of finely-sifted loam, leaf-mould, and sand; cover the seeds slightly, and place them in a heat of 70°. Keep the soil moderately moist, and when the plants make their appearance let them be near the light, in order to prevent their being drawn up weakly, and as soon as they are fit to handle put them singly into 3-inch pots in soil similar to that in which the seeds were sown. They will now, if well attended to, and given the requisite amount of heat, moisture, and shade, make rapid progress; they only require to be slightly protected from the sun's rays during the middle of the day, for if shaded to any great extent, as some plants are, they will be weakened. As their pots get filled with roots, move them into larger ones; use the soil for this shift in a more lumpy condition than hitherto, but still let it contain more sand than would be necessary for the generality of plants, one-fifth not being too much to add to the soil at all times. The most suitable mixture in which to grow them after the bulbs have attained some size is two-thirds good turfy loam and one-third fibrous peat, and the bulbs should be covered 2 inches. They require plenty of water when in active growth; support the shoots as they extend with some neat sticks inserted round the outside of the ball. Give a moderate amount of air early in the day, close the house in good time in the afternoon, and syringe overhead at the same time. The coolest end of the stove or the temperature of an intermediate house will answer better for them than hotter treatment; they will grow in an ordinary greenhouse, but so treated they do not attain the size and vigour which they do when brought on in heat until the flowers are about to open. Plants from seed, if well managed, may be expected to produce a few blossoms the first season; but if not allowed to flower they will make better bulbs. As soon as they show signs of their growth stopping in autumn, give less water, but do not withhold the supply all at once, or it will have an injurious effect by preventing the bulbs going through their naturally gradual ripening process. When ripe, allow the soil to become quite dry, and keep it in that condition all through the winter, laying the pots on their sides in a temperature of from 46° to 50°. In March they may be started; put them singly in 4-inch pots in soil such as that recommended for the second shift the preceding summer, use it in a rather dry state, and give little or no water until growth has commenced, as if too wet before the roots have begun to push, there is danger of their rotting. Place them in a heat of from 55° to 65°, when they will soon begin growing, and keep them near the light. As soon as they have made a fair quantity of roots, four or five of the bulbs may be put in a 12-inch pot; in this way while in a comparatively small state they will make much more effective specimens than if grown singly. When they are about a foot or so high, wire trellises should be fixed to the pots, and the shoots kept regularly trained round them. When the soil gets filled with roots they will require to be supplied liberally with water, and liquid manure, given once or twice a week, will assist them considerably. In other respects treat as recommended for the previous season, and when they begin to open their flowers they should be removed to a cool house, where they will last much longer in bloom than if kept in heat.

When the flowering is over, gradually dry them off as before, and if the size of the pots makes it objectionable to winter the bulbs in them, they may, when the tops are dead, be taken out and wintered in smaller ones filled with thoroughly dry earth, with which they must be covered to prevent too much shrivelling. If, when the bulbs get large, it is found desirable to increase them by division in the manner stated, it is essential that they should not receive any water till growth has commenced and the cut part has had time to heal, or they will be liable to rot, for the prevention of which mishap surround them with an inch of dry sand at the time of potting.

Two species only of Gloriosa are worth growing.

G. Plantii (syn.: G. virescens). Lower petals light yellow; upper portion of the flower bright red, tinged with orange. From Mozambique.

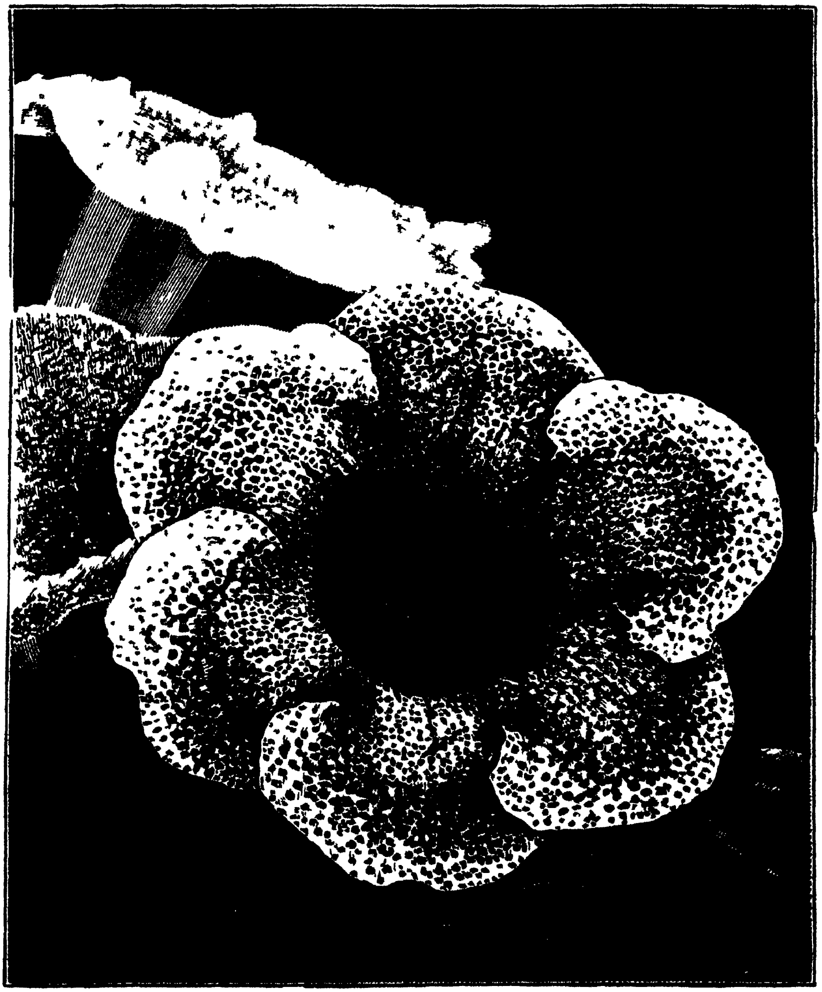
G. superba. Has rich orange flowers tinged with red, reflexed and crisped on the margins. A native of the East Indies.

INSECTS.—Gloriosas suffer but little from the depredations of insects, their juices not being relished by them.

GLOXINIA.

The members of the present race of these lovely stove Gesnerads owe their parentage to a few species imported from different parts of South America. The hybrids recently raised are, however, superior to the imported species both in size and form, and their colours are almost unlimited, varying, as they do, from the purest white through the different shades of pink to deep red, and from pale blue to intense purple, with endless forms of spotting and banding with light and dark colours; in fact, there are few flowers in which there is so much variety, and they also possess other points equally noteworthy. Gloxinias may be increased rapidly either by means of seeds or cuttings; they are likewise easily grown and most useful for decorating not only the stove, but also the intermediate house in summer, in which they continue to bloom more or less for a considerable period. Their flowers, too, are very useful when cut, lasting in good condition in water for several days, provided the plants have made their growth and produced their flowers in a thoroughly light situation, with the amount of air requisite to impart sufficient substance to them—the latter an indispensable condition when they are required to be used in a cut state. Indeed, the flowers of few plants depend so much as regards durability upon the way in which the plants have been previously managed as those of the Gloxinia, the whole character of which is much changed for better or worse according to the conditions of cultivation. When well grown the leaves are firm and short, borne on stout foot-stalks, and the flowers stand well above the foliage; whereas, if grown either too moist or too hot, with insufficient light, the whole plant has a soft, flabby, straggling appearance that effectually destroys its beauty. By having a sufficient number of plants and bringing them on at different times, a succession of flowers may be kept up from March until the end of September or later.

In raising Gloxinias the seed should be sown early in spring—say about the middle of February, so as to allow the plants an opportunity of attaining sufficient size to flower during the summer in a way that will exhibit their true character. Sow in an ordinary seed pan; put an inch of drainage on the bottom, and on that place a little sphagnum. The soil ought to consist of equal parts of loam, peat, and leaf-mould, all sifted; add to it one-sixth its bulk of sand, as it is essential that it should be loose and open, or in transplanting the roots of the young seedlings will be injured; fill the pan with soil to within half an inch of the rim, press it down moderately firm, then water with a fine rose, so as to settle the surface, and on this sow the seeds, not too closely, or the young plants become crowded and consequently drawn up before they are large enough to pot off. Cover the seeds very lightly, and place them in a temperature of 60°. As soon as the young plants appear stand them close to the light, screen them from the mid-day sun, supply them with water, and give a little air during the day. When the leaves are an inch long move the plants singly into 3-inch pots, using soil similar to that in which the seeds were sown, and at once replace them near the light, raising the temperature as the days increase in length. By the end of June



GLOXINIAS.

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they will require shifting into 4-inch pots; use the soil without sifting, and treat them as has just been recommended. When they bloom the best kinds ought to be marked for propagation and the inferior ones discarded.

After the flowering is over give less water, discontinue shading, and admit more air, so as to ripen the growth. When the leaves have died down the soil should be allowed to become quite dry; keep them through the winter in a temperature of 50°: it is not safe to keep them cooler than this for any length of time. They generally winter best when the bulbs are allowed to remain in the soil and pots in which they have been grown, but as they become large, and are in pots of a considerable size, this is not always convenient; in that case the roots should be stored in paper bags filled with dry sand to preserve them from the air, otherwise they shrivel, and thereby receive serious injury.

To give a succession of flowers through the summer a portion of the plants may be started about the middle of February, and a further supply in March. Let the pots be proportionate to the size of the tubers—about 7 inches in diameter will be large enough for the second season. In potting just leave the crowns of the tubers on a level with the surface of the soil, and immediately they are potted, place them in a temperature of 60° at night, allowing it to become 5° or 10° warmer by day; if not put in heat as soon as potted, the roots will rot. The soil ought to be in a slightly moist state when used, and little water should be given until growth has commenced. Treat them throughout the season as to heat, shade, light, and moisture as recommended for the preceding summer. As already pointed out, their satisfactory flowering will depend upon their receiving abundance of light; a shelf over a pathway within a few inches of the roof is the best place for them. In such a situation not only do they get the requisite amount of light, but they also receive more air, and both are essential for securing short, sturdy growth. This summer they will bloom well and their tubers will increase considerably in size, yet it is in the third and fourth years after sowing that they will make the finest display. When the tubers get large they may be divided, some of the buds with which the crown is furnished being retained to each portion; but the most general method of propagation and by far the most expeditious is by leaf cuttings.

If the leaves are taken off in summer when fully matured, with a portion of the stalks attached to them, and this portion is inserted in 4-inch or 5-inch pots, drained and filled with half peat or loam and sand, with half an inch of sand on the top, and kept in a brisk heat, slightly shaded and moist, they will form healthy bulbs before autumn. If the variety to be increased is scarce, several may be produced from single leaves by cutting the midrib through on the under side in four or five places. Then lay the leaves flat on the soil in pots or pans prepared as above; over each place where the midrib has been severed secure the cut parts to the soil with a pebble about the size of a cockle, and at these points small tubers will be formed which, when the leaves have decayed in the autumn, will require to be wintered and afterwards grown on in every way as recommended for the plants raised from seed.

The following named varieties are all well worth growing:—

ERECT FLOWERING KINDS.

G. A. Haut. Blue spotted on a white zone.

A. Alfred de Musset. Bright red, striped with lilac.

G. Byron. White, amaranth lobes.

G. Chateaubriand. White lobes, throat delicate rose.

G. Don Luis of Portugal. White tube, throat spotted carmine, zone violet, white limb.

G. Duke of Edinburgh. Tube white, throat deep violet, shaded with maroon.

G. James Brand. Throat creamy yellow, spotted with violet, lobes violet.

G. Magenta Queen. Tube deep red, base of limb deep crimson, edged with magenta.

G. Mr. Thomas Binney. Red throat, limb crimson.

G. Panthère. Blue, spotted with white, throat white and massive.

G. Scarlet Gem. White tube, throat spotted with lilac, limb deep scarlet.

G. The Czar. Tube white, limb purplish-violet.

PENDENT VARIETIES.

G. Alice. Limb mauve, throat yellow.

G. Angeline. Tube rose, barred with white.

G. Bird of Paradise. Lilac throat, white spotted.

G. delicata. Outside of tube white, inside violet, base of lobes margined with white.

G. Eblouissant. Bright red, throat white.

G. Grand Monarch. Tube white, throat violet, spotted with white, limb deep crimson.

G. M. Alphand. White tube, violet spotted throat, purple limb.

G. M. Grivet. Throat spotted with maroon, bordered with violet, mouth spotted with violet.

G. Mogul. Tube spotted with red, crimson purple limb.

G. Mrs. William Bull. Red, flaked with white.

G. Ne Plus Ultra. White, with crimson throat, spotted with carmine.

G. Washington. Deep vermilion.

G. Wilhelmine. White mouth, banded with blue, throat spotted with rose.

INSECTS.—Gloxinias are not usually much troubled with insects. Thrips will, however, sometimes attack the leaves, in which case sponging and fumigation are the best remedies. If aphides make their appearance on the young flower-stalks they can be best destroyed by means of fumigation.

GNIDIA.

Evergreen greenhouse flowering shrubs, natives of the Cape of Good Hope. All the species bear yellow flowers, and are summer bloomers. They are not equal from a gardening point of view to many plants that thrive under similar conditions. They succeed with treatment such as recommended for Adenandras, which see.

GOMPHIA.

Evergreen stove shrubs, some of which grow to considerable size. Their flowers are not equal in appearance to those produced by many occupants of the stove, although they are distinct in appearance.

Their method of propagation, and the after treatment they require, are such as recommended for Gardenias (which see) except that at no time must they be kept so cool as Gardenias may be.

G. decora. This species grows to a good size, forming a large bush. Its flowers are yellow, and are produced in summer. From South America.

G. obtusifolia. A distinct-looking kind, a low grower. Also a summer bloomer, the flowers yellow. A native of Jamaica.

G. Theophrasta. Has bold, handsome foliage, and attains a large size if allowed sufficient room. A yellow-flowered summer bloomer. From South America.

GOMPHOLOBIUM.

These most elegant pea-blossomed evergreen greenhouse plants are natives of New Holland. Viewed from a short distance, their thread-like branches and inconspicuous leaves are scarcely perceptible, giving the flowers the appearance of being suspended in the air.

They are naturally climbers in their native country, clinging to other more robust-growing plants, consequently in a cultivated state they require support. They are sometimes grown on wire trellises, of a balloon or circular shape, but these are objectionable, because the thread-like stems get so entwined round the wires that they cannot be removed without seriously injuring the plants, even when they get too large for the trellis they are first put on, and if placed on a large one to begin with, it has for some time a bare, unfurnished appearance. There is nothing equal to thin, painted sticks over which to train the shoots, and care should be taken never to allow them to become too much entangled.

In selecting young stock, it is necessary to see that they are quite clear from any of the worst kinds of insects that plants are subject to—such as white and brown scale. The Gompholobiums are comparatively tender plants, and are not able to bear any application of insecticide strong enough to kill the insects. They require to be wintered in a light situation in a good house, where a heat is kept up in the night of from 40° to 45°; they are plants that cannot bear keeping in so low a temperature as some other natives of the same country, as they are liable to become a prey to mildew, which destroys the leaves when it is scarcely perceptible upon them. In such a situation as above they will keep growing slowly through the winter. They are subjects that always require more than ordinary care in watering, having very fine roots, but as their feeding fibres are never apparently quite at rest, they must never be allowed to get too dry. It must not, however, be understood that they will bear water-giving before the soil is in a state approaching dryness, as might be done with impunity to strong, coarse-rooted plants.

They strike from shoot-cuttings, which should be taken off about the end of April, such as are in a growing state, and have got moderately firm, being selected. The cuttings should consist of three or four joints each, and must be put an inch or two apart in 6 or 7 inch pots, in sand, covered with a propagating glass, kept moist, moderately close and shaded, in an intermediate temperature, where they may be expected to root in a few weeks. Then remove the glasses, encourage growth by a genial atmosphere, and when fully rooted move singly into small pots, drained, and filled with fine peat, to which add a good sprinkling of sand; shade, and keep the atmosphere of the house close and moist until the little plants have begun to grow away freely, when give a little more air, stopping the shoots to help the lower eyes to break; syringe overhead lightly in the afternoons, and keep the material on which the pots are stood damp. Shade when the sun is at all powerful, and give water to the soil before it gets too dry; continue to treat in this way until the end of August, before which a small stick or two will be needed to support the shoots. After this cease shading and syringing, and give more air through the autumn; winter in a temperature of 46° to 48° in the night, standing the plants near the glass, where they will keep on growing. About the middle of March shift into 4-inch pots, in soil similar to that of the first potting; pinch out the points of the shoots, and keep a genial growing atmosphere. As the sun's power increases give a little shade in the middle of the day, syringe overhead in the afternoons at closing time, and keep the material on which the pots stand damp. Give more air as the summer approaches, and about the end of June move into 6-inch pots; treat subsequently as hitherto advised, again stop the shoots, and give more sticks, to which keep the shoots trained. Dispense with shade and the use of the syringe as the autumn comes on, and winter at about 45°. At the end of March the plants will be in a condition to remove into larger pots. Being of moderate growth they do not require nearly so much root-room as plants of larger, more vigorous habit; pots 2 inches larger will be sufficient, except in the case of any plant that may be more than ordinarily full of roots. Use good fibrous peat, at this potting, about the size of common acorns, not larger. This is of importance with rather weak-growing subjects, for if used in a bigger state the lumps, having in them no more sand than the peat naturally contains, are unsuitable for the roots of plants of this nature. Add one-sixth of clean sand, as gritty and free from dust as it can be obtained. Pot firm, using the potting-stick to make the new soil sufficiently close; place the plants where they can be kept a little closer for two or three weeks, and shade slightly. Each plant should at this time have about a dozen thin sticks placed to it, over which the shoots should be evenly dispersed, training all over the surface and keeping the base well furnished. This must be attended to from the first, or there will be some difficulty in remedying the defect afterwards. Use thin bast to tie the shoots with, and do not allow them to twine round the sticks so as to get too fast a hold. Do not let them intertwine with each other and become twisted cord-like, or they will get injured when being undone. By the end of April the plants should, if all goes well with them, be growing apace. They will at this stage of development be benefited by a dash with the syringe every afternoon—get well under the leaves and occasionally turn them round, so that all sides may get the benefit of the water, which they require to keep down red spider. In the summer season stand them on a bed of ashes, or ashes with a little sand mixed. Keep this regularly damped morning and evening, and this will materially assist them. As soon as the bloom buds, which they will push freely, get large enough to handle, they should be picked off before they expand, or the plant's natural disposition to free flowering, even in a small state, will materially interfere with the growth they ought to make. By the end of June, or beginning of July, they should need a second shift, to pots again 2 inches larger, using soil similar in every way to that used in spring. At this warm season they will need to be kept closer, and to have more shade for some days, and will also require an abundant supply of water thrown about the paths and under the stages, as well as on the bed on which they stand. They will likewise now want a few more sticks to support the extending shoots. In a fortnight or three weeks they will get hold of the new soil, and will bear more air and do with only such shade as will break the sun's rays in the middle of the day. Through the autumn gradually inure them to plenty of air and all the sunlight possible, so as to get the growth ripened before winter comes, when they must receive less water at the roots, and be treated in other respects as advised before. Pot again in April, as in the preceding season, using the soil in a little rougher state. They should now bear a 3-inch shift, and as soon as potted ought to be taken off the sticks, and new ones put in of a sufficient length to support the plants for the season; disperse the shoots, as previously, evenly over them.

After potting treat as before, so far as the necessary shade, air, and moisture in the atmosphere are concerned. If the plants do well they will this season show a profusion of flowers, which may be allowed to open, as they will make beautiful objects for decoration, and can be used for this purpose in the conservatory or elsewhere; but while in such situations they must have a good position, where they will receive plenty of light, and not be crowded too closely among other plants. As soon as the flowering is over remove them to the hardwooded house, and treat as advised for the preceding season, except that this summer they will not require a second potting, except in the case of any individual plant that appears unusually strong, and gives evidence of more than ordinary root-power. Such may receive at the end of June a 3-inch shift, but with these exceptions the spring potting will be enough. Attend well to the plants through the summer, more especially in the matter of water, which should never be given to them by inexperienced hands, or all the previous care will very likely be thrown away. Gradually inure to all the air possible through the autumn, without placing them in a cold draught too near where air is admitted. They must never be submitted to exposure in the open air, as in the case of such plants as are stronger in constitution or require it to induce a flowering disposition. These Gompholobiums are naturally such free-bloomers, that if in health they are certain to bloom profusely. Continue to give the necessary attention to training before the shoots get too much entangled, and in the winter remove all the sticks, using in their place such as will meet the requirements of increased growth. Through the winter keep them where the temperature will be a little over that required for the greater number of greenhouse hardwooded subjects, say not lower than 40° in the night. In the succeeding May and June they should make good blooming plants, fit for exhibition if so required. They should not be placed where they will be subjected to a low temperature, such as many plants can bear early in the spring in a north retarding house, or the chances are that there will be serious loss of leaf through mildew; but, as their flowers begin to open in May, they may with advantage be removed to such a situation; it will otherwise be necessary to shade them while in flower, as the sun destroys the beautiful bright colour of the flowers.

After blooming this season lay the plants on their sides, and give a good washing with clean water applied by the syringe. This will remove any dirt that may have accumulated on the leaves while in flower, and keep down insects. As soon as they have pushed freely into growth give such as seen to require it a 3-inch shift; this will be as much as even the strongest plants of Gompholobium will ever need. They naturally flower in a younger state than many things, and consequently do not often last so long. Such as retain health and keep on growing until the soil gets at all exhausted, may be assisted with weak manure-water in the season of active growth. As these plants are not so long lived as some others it is well to keep up the stock by each year starting two or three young ones to take the place of any that may go off.

G. barbigerum. Is one of the purest yellow flowers in existence, and is a general favourite.

G. polymorphum splendens. This, the best of the genus, has dark crimson flowers, with a lighter-coloured eye, three-fourths of an inch in diameter. In a well-grown healthy plant they are produced in quantities for from four to six weeks during the spring. The plant has when either in or out of flower a very distinct appearance.

INSECTS.—We have already alluded to these plants being subject to red spider and pointed to the necessity for a vigilant look-out for this insect; this is the more necessary as they are sparse-leaved, and if once their leaves are seriously injured the roots will suffer in proportion, and the plants will never afterwards look so well. They are sometimes attacked by aphides upon the points of the young shoots, but these can easily be kept down by fumigation.

GOMPHRENA.

(Globe Amaranth.)

This old well-known annual is a native of India, and is one of a genus most of which are plants of shrubby habit. The long duration of its hard papery textured flowers make it valuable for decoration in the greenhouse or dwelling. The seeds should be sown about April in pans filled with fine soil in a hot-bed, house, or pit, where a temperature of about 60° can be maintained with the soil kept moderately moist. The plants will soon come up, when stand near the glass, shading slightly from the sun, and give air in the day. As soon as the young seedlings are 2 or 3 inches high move singly into 3-inch pots, using good turfy loam well enriched; keep a little close for a few days, after which give a moderate amount of air in the day with a little shade when required. Syringe overhead and keep the soil moderately moist. When the roots have got full hold of the soil move into 6 or 7 inch pots, which will be large enough for them to flower in. After this treat as before; the plant is naturally of a branching habit, but as they grow larger each will require a small stick to support the leading stem.

Cease syringing as the flowers begin to open, and when they are fully grown move to a greenhouse or elsewhere where they will be cooler, with a drier atmosphere. So treated the flowers will last fresh for many weeks. The two forms, the red and the white varieties, differ in nothing except the colour of the flowers, requiring similar treatment in every way.

INSECTS.—Syringe to keep down red spider. For aphides fumigate.

GONIOPHLEBIUM

A distinct and beautiful genus of Ferns, comprising stove and greenhouse species, many of them differing widely in size and appearance. In the Javenese G. subauriculatum we have one of the most elegant drooping Ferns in cultivation; the pendant fronds of a well-managed example of this kind will reach 8 or 9 feet in length.

For propagation and cultivation, see Ferns, general details of culture.

STOVE SPECIES.

glaucophyllum. Brazil
G. menisciifolium. Brazil.
G. subauriculatum. Malay Islands.
G. squamatum. West Indies.

GREENHOUSE SPECIES.

G. appendiculatum. Mexico.
G. lepidopteris. America.

GREVILLEA.

The ornamental-leaved section of these are pretty decorative plants, with finely divided elegant Fern-like foliage. They are well adapted for room or table decoration, or for mixing with flowering plants in greenhouses and conservatories. There are large numbers of species in existence, but only a few are considered worth growing. Grevilleas are easily managed, and quickly reach the most useful size for general use, which is when from 15 to 24 inches high. They are easily raised from seed, which should be sown about the beginning of February in shallow pans filled with fine sifted peat and sand; sow the seeds thinly and cover very lightly. Stand in a temperature of 60°, keeping the soil slightly moist, and as soon as the plants are up keep them close to the glass. In a few weeks they will be large enough for putting singly into small pots, in soil of a like description to that in which the seeds were sown. Shade from bright sun, and keep the atmosphere moderately moist; syringe overhead daily, and give air when the weather will permit. The temperature should now be kept about the same in the night as that in which the plants were raised, and allowed to rise by day more or less with the state of the weather. At the end of May move into 6-inch pots, and put a small stick to each plant to keep the stem straight; give air freely and keep them well up to the glass, with a little more shade as the sun gets more power; be careful never to let the soil get dry, or the lower leaves will suffer, and the appearance of the plants be spoilt. They will grow fast and by the latter end of summer will have reached a serviceable size, when they can be used for any purpose for which small handsome-foliaged plants are available. In winter locate them in a house or pit where there is a temperature of about 45° in the night, with less water, but on no account let the soil get dry. Such as are kept on to attain a larger size must have more pot-room in spring, and be given the usual greenhouse treatment this summer. After this they usually show a disposition to lose their bottom leaves, which detracts much from their appearance; consequently young stock should be grown on each year.

The two following kinds are most liked, and will generally be found sufficient:—

G. robusta. From Port Jackson.

G. rosmarinifolia. From New South Wales; a pretty plant, but not equal to the first-named.

INSECTS.—Red spider sometimes affects Grevilleas, but can easily be kept down by a free use of the syringe. For thrips or aphides fumigate.

GRIAS.

These are evergreen trees requiring stove heat. They grow to a large size, attaining a height of 30 or 40 feet, and if to be seen in anything approaching a fully-developed condition they must have a very large house, such as devoted to tropical plants.

They are increased by cuttings of the shoots which need a strong heat, and to be subsequently grown on with stove warmth until large enough to plant out, when they should have a good-sized bed composed of sandy loam.

G. cauliflora. A large-growing species, producing the fruit known under the name of Anchovy Pear. It is a native of Jamaica.

G. Fendlerii. A handsome-leaved species that bears yellow flowers. Introduced from Panama.

G. zamorensis. Of this species little is known as to what its appearance will be when fully grown in a cultivated state, further than that it has large handsome foliage. From South America

GRIFFINIA.

Griffinias consist of some half-dozen species, all stove evergreen South American Amaryllidaceous plants, compact in habit, and of a free-blooming character; the flower-stems spring from the centre of the bulbs and rise well above the foliage, terminating in a large umbel of delicate blue and white or purple and white flowers, in shape not unlike those of the blue Agapanthus. Few bulbous plants better deserve a place in even the most select collections of stove subjects than these. They are at all times handsome, and when strong specimens are in flower they continue to open their blooms in succession for three months at a time, and are equally suitable for conservatory decoration or for cutting; for the latter purpose they have few equals, the colour (always scarce except in flowers of diminutive size) particularly adapting them for arranging with others of paler or more vivid hues; their substance also enables them to retain their freshness for days in water, or in any moisture-holding material. The plants likewise have the merit of being easily grown, and can be cultivated successfully by those who have not the means of growing a number of things requiring a very high temperature. An intermediate heat, such as that of a vinery where a little fire is used, will answer for them quite as well as a warmer situation, but they should never, except in warm weather, be subjected for a long time to a greenhouse temperature, even when they have completed their growth and are at rest, or they are liable to suffer. The only drawback to their more general cultivation is their scarcity, consequent upon their slow habit of growth, a circumstance still further aggravated by keeping them quite dry when at rest. Nothing can be more injurious to any evergreen bulb than this kind of treatment when carried too far, and especially in the case of Griffinias. Unlike Eucharis amazonica, Griffinias cannot be grown and periodically rested so as to induce them to flower several times in the year; on the contrary, they need a long season to become fully developed, and want a long rest afterwards before flowering, during which the soil should be kept much drier than when they are in active growth, but should never be so dry as to cause the leaves to flag.

Another reason why these plants are scarce is that so few succeed in raising them from seeds, the failure being often attributable to the seeds being covered with soil, whereas they should be allowed to remain on the surface of the soil in the pots, otherwise they will decay. Griffinias can also be increased by separation of those bulbs that are produced as offsets in the same manner as with Amaryllis, but their progress is very slow, and the roots are so closely interwoven as to render their separation almost impossible without considerable mutilation. When they are to be divided, the ball should be turned out of the pot and the whole of the soil washed very carefully from amongst the roots, by which means they may be more readily disentangled without so much breakage. They should then be placed singly in from 4 to 6 inch pots, according to the size of the bulbs, and treated as hereafter described for plants raised from seed. After blooming in summer and autumn the seeds make their appearance, growing to the size of Potato Apples, but in appearance more like small green unripe Tomatoes, being corrugated and irregular in shape. They must be allowed to remain on the plants until they either fall off of their own accord or can be removed by very slight pressure, and should then be sown immediately. For this purpose use an ordinary seed-pan proportionate in size to the number of seeds, put an inch of drainage in the bottom, and on this a little sphagnum or turfy material.

The soil should consist of yellow loam, with about one-sixth of sand added; the loam should not be sifted even for the seeds, but pulled into small pieces and pressed moderately close, a little sand should be sprinkled on the top, and the whole given a good watering; then lay on the seeds, pressing them gently into the surface, so that they may imbibe the moisture from the soil, which must be kept continually damp; put them in a temperature of 55° at night, with a few degrees higher during the day; so treated, they will in the course of two or three months vegetate. They should not be disturbed until the protruding roots have descended into and got a firm hold of the soil, during which time a leaf will be formed to each seed. This will usually occupy the whole of the winter and spring after they are sown. Through this time the soil must be kept moderately moist, after which they should be transferred singly into well-drained pots, in soil similar to that in which they were sown. Through the spring the temperature should be gradually raised, and during the summer it may range in the night from 60° to 65°, and 10° or 15° higher in the daytime with sun-heat. Keep the plants well up to the light, giving a slight shade in the middle of the day in bright weather; admit a moderate quantity of air, close the house early, and slightly damp them overhead at the same time. Reduce the temperature in the autumn to 55°, at which point they may be kept during the winter, and at the same time give as much water as will preserve the soil slightly moist. Give the young plants as long a season of growth as possible by placing them about the middle of February in a temperature of 60°, and giving a little more moisture to the soil as soon as they show signs of growing. Increase the temperature both by day and night as the weather gets warmer, shading slightly as before and syringing a little when the house is closed in the afternoons. By midsummer they will most likely have so far filled their pots with roots as to require moving into others of a larger size, and now the soil should be a little more lumpy, and should have added to it enough sand to keep it quite sweet. After this treat the plants through the autumn and winter as recommended for the preceding season, again starting them early; or if there is the convenience of a house that is kept 5° warmer during the winter from the first than the temperature prescribed, they may with advantage remain in it, by which means they will make more progress. If the growth is satisfactory, the strongest plants will most probably flower in the autumn three years from the time the seeds were sown, although the bloom-spikes will not be nearly so strong as when the bulbs get fully grown, which will very likely be two years later, when they will increase by making offsets. After flowering each autumn they will make their growth, during which time they should be kept at about the same temperature as that already recommended, and supplied liberally with water until the growth is finished, which will be apparent by the leaves attaining their full size and solidity. When the plants have begun to bloom it will to some extent alter the time of their growth, retarding it considerably, so that it may not be completed before May, after which the soil ought to be maintained as before described in a slightly moist state. During the summer the increase of solar heat and the higher temperature necessary for the other occupants of the house will cause them to push up their bloom-stems, the flowers opening through the autumn. Each year after blooming they require larger pots, and until they begin to increase freely by offsets, an inch shift at a time will generally be enough, as they must never be over-potted, although as the specimens get large they will make an abundance of roots and fine leaves, and require proportionate pot-room, while the flowers also will be proportionately strong. When the plants attain specimen size it will not be necessary to pot them every year. A very imperfect estimate can be formed of the beauty of Griffinias while they are in a comparatively small state with one or two flower-spikes as compared with large examples that will produce from a dozen to thirty, each proportionately larger than those borne by smaller plants. They may be grown on until they fill 18-inch or 20-inch pots, or be divided as already described. Those who are fortunate enough to possess a good stock of these valuable plants will do well to grow both small and large specimens. When in flower they may be placed for several weeks in a conservatory somewhat warmer than an ordinary greenhouse, but they should not remain too long, especially if the autumn is far advanced and the weather getting cold, as they will be commencing growth, which would get checked, and thus materially interfere with their progress during the ensuing season.

The undermentioned, if treated in accordance with the above directions, will be found an acceptable addition to any collection of plants:—

G. Blumenavia. A smaller-growing species than G. hyacinthina maxima; flowers a little earlier in the season. From Brazil.

G. hyacinthina maxima. A large and fine species, with bluish-violet flowers, each petal having a white stripe from the base down the centre for a considerable portion of its length. A large specimen will bloom through the whole of the latter part of the year. A native of South America.

G. ornata. A new introduction from Rio de Janeiro, with large heads of purplish-lilac flowers fading off to white. A very free bloomer, sometimes producing two scapes from a single bulb; it flowers in the autumn or winter.

INSECTS. — When aphides affect the young leaves and flower-stems, they may be destroyed by fumigation and sponging. Thrips also attack the undersides of the leaves, and should be either cleaned off with a sponge dipped in tobacco water, or fumigated. Brown scale and mealy bug will also affect them; these can be best removed by sponging.

GUILIELMA.

A small genus of stove Palms of tall, slender habit, presenting quite a contrast in appearance to the more robust kinds of the family.

For propagation and cultivation, see Palms, general details of culture.

G. speciosa. This is an edible species, the fruit of which forms a considerable article of food in the countries where it is found indigenous. It comes from Tropical America.

G. utilis. A fairly handsome species, with good-sized pinnate leaves. A native of Costa Rica.

GUZMANNIA.

In these we have Bromeliaceous stove plants nearly allied to the Æchmeas, and having much the same habit of growth. The flowers are almost hidden by the bracts, and thus have a singular appearance. They occupy little room, and even when not in flower are pretty.

For method of propagation and details of cultivation, see Æchmeas.

G. picta. This species is often met with under the name of Nidularium fulgens. It is a close, compact grower, the short, recurved leaves giving it a vase-like appearance. It usually flowers in summer.

G. tricolor. A pretty species that forms stout flower-spikes; the bracts, which are a combination of red, dark purple, and green, are its chief attraction; the flowers are white. It blooms in the spring or summer. Indigenous to the West Indian Islands, and also found in South America.

GYMNOGRAMMA.

In these we have a genus of stove Ferns, justly favourites with cultivators; it includes most of the gold and silver species, with their singularly powdered surface, which in the case of some extends to the upper as well as the under surface of the fronds, and also to the stalks. Most of the species can be confined to moderate-sized pots. To be kept in good condition through the winter they should have warmer treatment than most other Ferns.

For propagation and cultivation, see Ferns, general details of culture.

G. calomelanos. West Indies.

G. chrysophylla Laucheana. West Indies.

G. chrysophylla Laucheana grandiceps. West Indies.

G. lanata. Veragua.

G. Martensii. Garden hybrid.

G. peruviana argyrophylla. Tropical America.

G. pulchella. Tropical America.

G. sulphurea. Jamaica.

G. tartarea. South America.

G. tomentosa. Brazil.

G. Wettenhalliana. Garden variety.

HABRANTHUS.

These are greenhouse bulbous plants that bear handsome flowers.

They succeed, both as regards propagation and after growth, under conditions like those advised for Zephyranthes, which see.

The following are the most worthy of a place: –

H. Andersonii. A yellow and red flowered species from Monte Video. A spring bloomer.

H. Andersoni texanus. Has yellow flowers; it blooms in spring. From Texas.

H. fulgens. Flowers scarlet, produced in spring. A native of Chili.

H. hesperius. Straw colour. A summer bloomer. South America.

H. pratensis. Has scarlet and yellow flowers. A spring bloomer; from Chili.

H. roseus. Flowers rose-coloured; blooms later than some. From Chiloe.

HABROTHAMNUS.

These are stately evergreen greenhouse plants from Mexico, with a branching, drooping habit of growth, producing from the points of the shoots handsome bunches of attractive flowers, which open in succession for a long period. The natural habit of the plants is such that they can be grown in different ways, either as pot specimens, trained pyramidal fashion, or as standards with drooping heads, in which latter way they are very effective for conservatory decoration, where they can be used to relieve the more formal growing things. They are good growers, succeeding well in a mixture of peat and loam, and a moderate quantity of sand.

They are among the easiest of plants to propagate; cuttings of the young shoots when about four or five inches long can usually be had in spring, and if taken off with a heel all the better. They should be put singly in 3-inch pots, part filled with a mixture of sand and peat, the top all sand, stood in moderate heat, and kept moist and shaded under propagating glasses where they will soon root; then dispense with the glasses, and if the plants are to be grown as bush specimens pinch out the points. In July enough roots should be present to warrant moving the young plants into 6 or 7 inch pots; use soil with less sand in it than that in which they have been struck, keep in a growing temperature with a little shade and a sprinkling overhead with the syringe each afternoon until the end of August, when let them be cooler, leave off syringing and give more air, with as much water to the roots as will keep the soil moderately moist through the winter, during which the temperature should be about 40° in the night. By April give pots 3 or 4 inches larger than those they have occupied; these will not be too large provided the plants have plenty of roots, as they are free growers, and like a good amount of pot-room. Use the soil in a little more lumpy state than would be required by things of a more delicate habit, as these Habrothamnus, when in free growth, need a good deal of water, which always has the effect of inducing a closer, less porous condition of the soil in after years than in the case of subjects that require to be kept drier. For the same reason plenty of drainage is requisite, especially as the plants get large and are put in the pots in which they are to remain for some considerable length of time. Pot moderately firm and place in an ordinary greenhouse temperature. It will now be necessary to determine what shape they are to be grown in—bush, pyramid, or standard; if the first, the strongest shoots should have their points pinched out and be tied in a horizontal position, training one of the weaker growths up for a leader, which should also have its point stopped to induce the formation of side shoots; by thus bringing the strongest growths down there is a better chance of ensuring the base being furnished. As the sun gets powerful a little shade may be used; keep the atmosphere somewhat moist, and syringe daily overhead. When the roots have entered the soil freely give water liberally, and maintain the shape of the plants by stopping, and training through the season as required.

Few flowers will be produced so long as it is found necessary to pinch out the points of the shoots to secure the desired shape of the specimens, as, from the flowers being borne principally from the ends of the branches, they are thus removed. Towards the close of the summer discontinue both the use of the syringe and shading, and subject the plants to more air. Winter in a temperature of 40°, and again in the spring repot, giving as before a 3 or 4 inch shift; at the same time stop and train the shoots into their wonted position. Treat as in the preceding summer in every way, except that no further stopping for the season should be resorted to; by this means the plants will flower freely towards the close of summer and during the autumn, when they will be found very useful for standing in the conservatory. After they have ceased blooming they may be replaced in the greenhouse, and wintered in a temperature similar to the preceding season, giving no more water than is requisite to keep the soil sufficiently moist. Before growth commences, in the spring, they should be gone over, and have the shoots shortened considerably, so as to induce them to break back and keep bushy. When they have begun to grow they should again be moved into pots 3 inches larger, and treated in every way as recommended for the previous summer. If very large specimens are desired it is merely a question of pot-room by giving them more root-space; or they may be kept for some years in a good flowering condition by the frequent use of manure-water during the growing season.

Where Habrothamnuses are required to be grown as standards it is simply a matter of difference in the training; instead of stopping and tying out the shoots the plants must be confined to a single stem, which should have all side growths removed until the desired height is attained, when the point should be pinched out and the head formed by keeping the shoots stopped till the requisite number exist, after which, each season, when the flowering is over, the growths should be shortened so as to maintain the required form. These plants are also very suitable for planting out to cover a back wall or clothe a pillar, in which way some of the kinds, such as H. elegans, will go on almost continuously blooming, simply requiring the knife to be used so as to keep them in bounds and induce the production of shoots to furnish the allotted space with flowering growth. In the case of these plants, as of most others of a similar nature, when planted out the room given to the roots should always be regulated by the extent of surface to be covered; where too great root space is allowed proportionate to the required size of the head too much cutting back becomes necessary, whereby the ability to produce bloom is curtailed. When the soil has become exhausted a little of the surface from the border should be removed each sping before growth commences and replaced by new, in addition to which manure-water may be given at times during the growing season.

The following are good kinds:—

H. carminata rubra. Flowers red.
H. coccinea. Scarlet.
H. elegans. Carmine.
H. fasciculatus. Crimson.
H. tomentosus. Purple.

INSECTS.—Aphides must be kept under by fumigation; thrips and red spider will sometimes make their appearance, but can be destroyed by a free use of the syringe; when attacked by scale the shoots should be well cut in during the season of rest, and the stem and branches be thoroughly washed with insecticide strong enough to kill the insect

HÆMADICTYON NUTANS.

When handsome-leaved plants first became fashionable, those usually met with possessed beautiful and well-defined markings, and were of comparatively small growth, such as some of the Anæctochili, with the elegant veinings of the leaves of which this Hæmadictyon may be compared, for in some stages of its leaf development the nerves, both principal and lateral, come nearly up to those of Anæctochilus setaceus. But in later years, since so many plants of larger proportions have been introduced, many of the most beautiful—and this Hæmadictyon amongst them—are rarely seen. Hæmadictyon or Echites nutans is an evergreen twiner from the West Indies, and therefore requires a brisk stove heat to grow it, so as to bring out its delicate leaf markings to the full. Its young, soft, quick-growing shoots are not so easily rooted as those of some plants, but, as is generally found with things that do not propagate freely from shoot cuttings, it can be readily increased by means of root cuttings.

If a portion of the strongest are removed from a healthy plant, cut into bits about three-fourths of an inch long and inserted in pots filled with sand, so as just to leave the tops of the pieces above the sand, placed in a house or pit where a night temperature of about 65° is kept up, they will soon form buds and shoots. About the beginning of March is as good a time as any for putting them in, as then the plant from which the cuttings are taken will not have made much growth, and consequently will not receive much check or injury from the removal of a portion of the roots. When the shoots are 3 inches or 4 inches long, the young plants can be moved singly into small-sized pots at first, as this Hæmadictyon, like all its congeners, cannot bear over-potting; good peat, seven parts to one of sand, will answer for it. After this keep them close for a few days until the roots have begun to move, giving more heat as the weather gets warmer; they will bear as much as the hottest stove plants, with plenty of moisture in the atmosphere and shaded always from the sun when it is at all powerful, for if its rays when very bright come directly upon them, it will impair the beautiful veining in the leaves. It requires the ordinary amount of air needed by stove plants that succeed best with a humid atmosphere, but care must be taken never to overwater, as if the soil gets too wet it will rot the roots. The plant looks best when grown with four or five shoots, each allowed to twine up a thin stick. When the young stock require more room, the best way to manage them will be to put four or six in a 7-inch or 8-inch pot half filled with drainage, the rest sandy peat; so treated, they are much more effective than when grown singly. Through the remainder of the summer continue to treat them as so far advised. Winter in a reduced temperature, keeping them drier at the roots than most plants, and about the beginning of March head them down to within 8 inches or 9 inches of the pots, giving more warmth to induce them to break quickly. As soon as they have made new shoots 8 inches or 10 inches long turn them out of the pots, remove as much of the old potting material as can be done without injuring the roots, and place them in pots 2 inches or 3 inches larger, with fresh open soil. All they will now require is routine treatment such as advised for the summer before, giving longer sticks, as the plants, being stronger, will make much longer shoots. With a plant of this description the object will not be to grow large specimens, but rather to confine them to something like the size indicated, in which way they will better answer the purpose they are best adapted for, which is to afford contrast and variety among the many stronger and coarser-growing fine-leaved plants generally met with in stoves. They will last for years and can be kept within the size required by being headed down in the spring annually.

INSECTS.—This Hæmadictyon is subject to most of the insects that will live upon the nearly allied Dipladenias; they must be kept under by daily syringing with tepid water during the growing season, and sponging when required.

HÆMANTHUS.

These are bulbous plants, most of which are indigenous to the Cape of Good Hope, though a few are found in warmer parts of Africa. The flowers of most of the cultivated species have a singular appearance, being composed of a large quantity of filaments forming large globular heads supported on comparatively short stout fleshy stems, which rise from the bulbs in the way usual with other Amaryllidaceous plants. The flowers, varying in colour from pure white to red and crimson, are very showy, the heads being in the case of some of the species as large as double Pæonies; they are produced at various periods of the year according to the time the bulbs are started.

Hæmanthus are increased like Amaryllis by offsets which the strong bulbs produce: these should be detached from the old bulbs, say in spring at the time of potting before starting them into growth. Put the offsets singly into 3 or 4 inch pots according to the size they have attained; drain well—free open soil is requisite, such as composed of equal parts peat and loam, with a moderate quantity of sand: insert the bulbs to about half their depth, pressing the soil firmly. If a little more warmth than that of an ordinary greenhouse can be given them, say 45° or a little over in the night, with a proportionate rise in the day, it will be an advantage. Give no more water than is necessary to keep the soil slightly moist until growth has fairly commenced and they have made fresh roots, after which apply it more liberally; let them have plenty of air in the daytime as they progress. Syringe overhead when the house is closed in the afternoons and continue to treat in this way through the summer until the plants show signs of going to rest, when withhold water, letting the soil get quite dry. Winter the bulbs in the pots in which they were grown in a temperature not lower than 45°, and about April shake them out of the old soil and repot, giving increased room according to the size they have attained. Treat in every way as advised for the summer previous. Unless the offsets were a considerable size when taken from the parent plants, another season will elapse before they bloom. Again withhold water as soon as the plants show signs of going to rest, and winter as before. Re-pot in spring, and grow on as last year; when the bloom stems appear do not let water lodge about them, and as they advance stand the plants where they will get plenty of light. As the flowers open keep the sun from them or their duration will be shorter; after blooming treat as advised the previous summers. All that is subsequently needful is to give more pot-room as the bulbs increase in size and numbers. A large example, consisting of eight or ten full-sized bulbs, each bearing a strong head of flowers, has a most distinct and effective appearance. When the specimens get too large the bulbs may be separated before starting them into growth without affecting their flowering for the coming season.

The following are sufficiently distinct to deserve a place:—

H. albiflos. Flowers white.
H. carinatus. Pink.
H. coccineus. Red.
H. Pumilio. Pink.
H. sanguineus. Crimson.

All the above are from the Cape of Good Hope.

H. insignis. Crimson. From Natal.
H. magnificus. Scarlet. Africa.
H. multiflorus. Scarlet. Sierra Leone.

The three last-named require stove heat, but in other respects the treatment given for the cooler kinds will answer for them.

INSECTS.—Red spider sometimes attacks the leaves, to remove which sponge and syringe. For aphides fumigate.

HARDENBERGIA.

These are free-growing, free-flowering climbers, suitable for covering the roof or the supporting pillars in a greenhouse or conservatory.

Their habit of growth is very like that of the Kennedyas, and the mode of propagation, and the general treatment afterwards required, are like those which answer for Kennedyas, which see.

The following are desirable kinds:—

H. andomariensis.
H. digitata.
H. Lindleyana.

HARDY HERBACEOUS PLANTS

That can be Grown in Pots for Greenhouse Decoration and Forcing.

There are several hardy plants that form an important feature in the greenhouse in the winter and spring months, either forced or allowed to come on in a greenhouse temperature. The principal things to be observed with them is not to attempt to hurry them on too fast, and to let them have plenty of light, with a sufficiency of air during the time they are being forced, for on these conditions depend the appearance of the plants when in bloom. If too much hurried they are sure to be drawn up and look weak. A night temperature of 45° to 55° will in most cases be sufficient, with 8° or 10° more in the day for such as are forced; for those that are brought on without forcing an ordinary greenhouse temperature will suffice. In selecting plants for this purpose, those should be chosen that have been well grown in an open situation so that their growth has got well matured; take them up with as little injury to the roots as possible, and get them potted and out of the reach of frost before severe weather comes on.

The undermentioned are well adapted for using in the way indicated:—

Convallaria Polygonatum. (Solomon's Seal.)
Cypripedium spectabile.
Dielytra spectabilis.
Dodecatheon.
Helleborus niger. (Christmas Rose)
Nertera depressa. For its berries.
Orchis foliosa.
Pinks.
Spiræa japonica.
Spiræa palmata.

HARDY SHRUBS

Suitable for Forcing for Greenhouse Decoration.

There are numbers of hardy shrubs that bear forcing so as to come into flower during the winter and early spring months, and that are little, if at all inferior, in appearance to the regular occupants of the greenhouse. Of these, when to be so used, compact well-shaped examples should be chosen that have been prepared for the purpose by treating so as to have them well set with bloom-buds. It is also necessary to see that they are taken from the open ground and potted in autumn before hard weather comes on, and put where they will not get frozen.

In forcing care must be taken that they are not subjected to too much heat (especially when the forcing is begun early in the short sunless days), and to stand them as near the glass as they can be got. A night temperature of 50° to 55° will in most cases be better than a higher one. Lilacs, however, are an exception to this, as they will bear 70° or 75° without injury.

The following are all suitable for forcing in pots:—

Acers. For their handsome foliage.
Althæa frutex azurea plena.
Althæa frutex syriaca alba.
Andromedas.
Aucubas. For their berries, in a greenhouse temperature.
Azalea amœna.
Azalea, Ghent.
Azalea, mollis.
Bramble, double.
Cherry, double blossomed.
Clematis of sorts. Most of the newer hybrids flower beautifully in pots.
Deutzias.
Kalmias.
Laurustinus.
Ledums.
Lilacs.
Menziesias.
Pernettyas. For their berries, in a greenhouse temperature.
Prunus. Double flowered
Rhododendrons.
Thorns. Double and single.
Viburnums. (Guelder Rose.
Weigelas.

HEBECLINIUM.

The species comprised in this genus are often met with under the name of Eupatorium, to which they are nearly allied. They are free-bloming, useful, decorative, softwooded, greenhouse plants, easy to propagate and grow; the flowers are produced in corymbs on the points of the shoots.

Cuttings of the young shoots strike readily in spring, kept close, moist, and shaded in moderate heat; put them singly when rooted into small pots, and grow on with the usual greenhouse treatment through the summer, during which they should have pots 7 or 8 inches in diameter. Turfy loam with some rotten manure, leaf-mould, and sand answers well for them. they should have the points of the shoots stopped twice during the early part of the season to make them branch out. They flower nicely from spring-struck cuttings, but are more effective the second year; shorten the shoots well in after they have bloomed and give larger pots in spring. The two following species will in most cases be found sufficient:—

H. atrorubens. Has dull, red flowers that are produced in autumn. It comes from Mexico.

H. ianthinum. Flowers purple; this also is a late autumn bloomer. A Mexican species.

Insects. — Few insects trouble these plants, but sometimes aphides affect them, in which case fumigation is the best remedy.

HEDAROMA.

(Darwinia.)

Hedaromas are the most distinct, most difficult to cultivate, and among the most highly prized of all hardwooded greenhouse plants. All the species are subject to sudden death without the slightest indication of any disease. They grow freely, making quantities of strong healthy roots, the head of the plants making corresponding progress, with every appearance of continued robust health, yet often without any apparent cause or warning they die off suddenly. This is not to be accounted for by any peculiarity of soil or water, for the same thing happens wherever their cultivation is attempted, even with the most experienced growers who exercise the greatest attention and closest observation. Notwithstanding these serious drawbacks, they are plants that cannot be omitted from any collection that has pretensions to being at all complete. They are among the freest bloomers, producing their finely-coloured, singularly-formed flowers in profusion. There is no plant that lasts longer in bloom when in good health ; the crop of flowers for next year is set before the current year's are off ; they keep on gradually growing, and six months before they expand the plants are very effective. They also flower freely, at any size from 6 inches through to as many feet. If there is any cause to which we could ascribe their liability to die off so quickly it is to the plants having been struck from cuttings somewhat soft, produced in heat. Plants that we have struck somewhat cool and slowly, from the points of well-ripened shoots, lived and grew on for years as freely as could be desired. They are plants that evidently do not require anything more than the coolest greenhouse temperature, as they keep their roots always in action during the winter with a temperature only just sufficient to keep out frost, but at the same time the atmosphere must be dry, or they will suffer from mildew, to which they are much more subject than most things. The parasite must be diligently sought for at all seasons of the year, or it is useless to attempt their cultivation, as, if left unchecked, even for ever so short a time, it gets established and does injury that no after-treatment can repair. The plants require the best place in a thoroughly good house, well elevated up to the glass, with plenty of air during the season of their more active growth. Never use shade except in their early stages or after potting, when this has been carried out far on in summer, which, it never should be, for, as already observed, the roots when in health are always more or less active, which admits of their being moved either in the autumn when the sun's power is far declined, or early in the season before it has much drying influence.

Those who, in commencing their culture, purchase plants should always take care to select such as are free and not too large for the pots they occupy, for if they are at all pot-bound while young the chances are that they will die before they take to the new soil after potting. All the varieties require good fibrous peat, with one-seventh sand added, unless the peat naturally contains a considerable quantity. Pot firmly, and allow a little more space for water for these plants than for most hardwooded subjects, as when they require water there must be no half applications, or they will speedily perish.

Hedaromas strike from cuttings made of the points of the shoots either taken off in a comparatively soft immature condition in the spring or summer, or from the mature growth in autumn; the latter although the slower process we much prefer, for, as already said, we have found plants produced from such invariably much less liable to die off suddenly. The cuttings, consisting of moderately strong shoots about 3 inches long, should be taken off in September when the wood is getting moderately hard, put 2 or 3 inches apart in pots or pans in sand, kept close and moist, under a propagating glass in a temperature of 50° or 55° in the night through the autumn and winter, with, as a matter of course, a little more warmth by day ; so managed they will root in spring. About the end of May move singly into 3-inch pots using fine sandy peat, and stopping the points at the same time ; keep a little close until the roots have begun to move, when gradually expose to the full air of the house ; always give water as soon as required. A little shade may be an assistance this season in the brightest weather. Keep a little closer by the admission of less air to the house than is given to larger greenhouse stock, and syringe the material on which they stand in the afternoons up to the end of August, after which give more air and no shade so as to get the growth well hardened up before winter, through which keep them at about 45° in the night. In March if the plants are, as they may be expected to be, in vigorous health, and have plenty of roots, give them 7-inch pots, stopping the leading shoots and tying them well out. Treat through the summer as ordinary young greenhouse stock, with plenty of light and a little shade in very bright weather, and give more water than most hardwooded plants require. Winter as in the preceding year, and again in March give them a shift ; they should now bear putting into pots 4 inches larger. Keep a little closer for a month, during which time shade if the weather is dry and sunny. The reason for giving them a larger shift than would be advisable with most greenhouse subjects is, that there may be no necessity for a second potting during the hot season of the year, when they are more likely to suffer from it. If at the time of potting, the plants have a strong leader, with a decided disposition to the pyramidal form they are somewhat inclined to, the leading shoot should be taken out, or they soon get too high, and the base of the plant becomes naked; they are also sometimes disposed to throw up a quantity of strong shoots from the collar. These must be removed while they are young, or they quickly rob all the rest of the plant, and also render it too crowded. During the growing season keep the material on which the pots are stood damped with the syringe every afternoon, but never syringe these plants overhead at all. The summer management should be similar to the last until the middle of August, when they should be turned out-of-doors—not in the full sun, which is too trying for them, often rendering them hard, and inducing a stunted condition from which they rarely recover. The north side of a good hedge, or a low tree that will somewhat break the midday's sun, but where they will receive it morning and evening, will answer best A month's exposure this way in the open air will be found sufficient. The object of this turning out is to harden the season's growth so as to render it less subject to mildew. A temperature of 40° by night will now be sufficient during the winter. If all goes well the soil will by March be full of roots, and they should be moved into 15 or 16 inch pots; the peat should be used in a lumpy condition, if it contains plenty of fibre it may with advantage be used in pieces as large as hen's eggs. Add now a little more sand than at the first potting. Keep the plants well tied out. If fresh sticks are added each time the plants are potted the greater portion necessary for the support of the plants can be stuck in the new soil before the roots enter it, by which means injury to the roots will be avoided. Any branches that are disposed to outgrow the others must be cut back to induce an equality of growth. Treat as before in the summer; by August a full crop of flowers will be set on all the strongest shoots, after which again turn the plants out-of-doors for a month as in the preceding season. Although, as already said, the plants when they have got beyond their early stages of growth should be stood out-doors for a time at the latter end of summer, when they have reached a blooming size they must never be turned out until after the flowers are set, otherwise it is doubtful if they will bloom. With us H. tulipiferum never set any flowers after being moved to the open air. The flowers already set assume a deeper red colour in the open air than when kept indoors. Even if no trace of mildew can be discovered it will be a good practice in October to slightly dust the plants over with sulphur by way of a preventive. Let it remain on for a week or so, and then wash off with the syringe. Winter as before. During the coming season they should make nice specimens, and will bloom freely. As soon as the flowers begin to get shabby they should all be picked off, and the plants placed in the hardwooded house, where the lights are closed with a little sun-heat on the house, and water applied to the paths and stages in the afternoons. This will quickly bring them into free growth. When the usual time in August arrives, turn them out as before for a month to harden, in September give them a shift—3 inches will afford room sufficient for several years. In the ensuing spring they should make fine specimens, with a profusion of flowers. If they have grown and their wood has been ripened properly, the points of their strongest shoots will be furnished with three or four blooms each. Through the whole course of their existence the plants must be kept in the desired shape by stopping and training, as they will not bear cutting back.

There are three species now met with in cultivation, all requiring similar treatment as to soil, water, air, light, temperature, and general management.

H. fimbriatum. This is a more recent introduction, not so well known, and is a nice addition to the family, contrasting well with the others. Australia.

H. Hookerii. A weaker grower than H. tulipiferum, with smaller flowers, pale red in colour, generally produced singly at the points of the shoots. This species usually opens its flowers earlier than H. tulipiferum, but lasts even longer in good condition than that species. Australia.

H. tulipiferum. By far the best of the genus; its creamy-white bell-shaped flowers, or floral leaves, when well coloured, profusely streaked, and dashed with red, have a striking appearance, contrasting well with any other plant. Swan River.

INSECTS.—The disposition of these plants to go off suddenly is somewhat favourably counterbalanced by their almost complete immunity from insects. We have grown plants for a dozen years and never seen a single insect of any description upon them. They appear to be thrip and red spider proof. Brown scale, if it gets communicated from some neighbouring plant, will live upon them, but can be destroyed by two or three washings with insecticide.

HEDYCHIUM.

Among these stately herbaceous stove plants are some of the most beautiful and sweet-scented flowers we possess. They belong to the natural Order Zingiberaceæ, and grow to a height of from 3 feet to 6 feet; the flowers are produced in the form of large erect spikes from the apex of the shoots that are formed annually from strong fleshy crowns. They are strong-growing plants that require a considerable amount of pot-room, otherwise they do not acquire sufficient strength to flower well. They look best when grown to a size that will produce from three to half-a-dozen blooming stems yearly; being remarkably free growers, they soon attain dimensions that enable them to do this, and it is an easy matter to confine them within such limits, as the plants will bear dividing annually if required. Their propagation is by division of the crowns, which is best effected early in spring before the young buds at the base begin to move in the least. They should be turned out of their pots, and the roots so far as possible separated, retaining as many as may be to each of the old or preceding year's shoots; put these singly into 8-inch or 10-inch pots, according to the size and strength of the pieces. Good ordinary loam, to which a little rotten manure and some sand are added, answers best for them; they should then be placed in a temperature of 60°. It is not well to hurry them by too much warmth immediately after division; better let the roots have time to re-establish themselves before exciting top growth, or the shoots made the first summer will not be so likely to bloom. Give more warmth as the season progresses, but it is not necessary to keep them very hot. We have found that although they will bear a high temperature they will do with less warmth than many things that come from the same countries.

A cool stove or intermediate temperature will answer well for them. Give plenty of water when they begin to grow; this is necessary, for though their leaves would not flag like those of many plants if too dry, their growth would certainly suffer to some extent. They will succeed best with more air than the generality of stove subjects want, and they need no more shade than is found necessary to prevent the leaves being scorched. When the young growth has reached its full size the stems may be observed to thicken towards the top previous to the emission of the bloom-spikes. The time of flowering is sooner or later during the summer, according to the heat they receive and the time growth begins. They will stand, while in bloom, in a conservatory or cool house, where they will look well in association with other plants. After flowering place them through the autumn and winter in a temperature of 55°; the old stems that have previously flowered may each year be cut away about the time the young growth approaches its full size; up to this they assist the shoots that spring from their base. In the spring give pots 2 inches or 3 inches larger, removing some of the old soil and replacing it with new. The subsequent treatment needed will be to give more root-room as required, and when the plants have got as large as wanted, they can either be divided into single crowns in the way advised or simply cut in two.

There are a good many kinds in cultivation; the undermentioned is a selection of the best:—

H. angustifolium. A strong-growing species; it bears handsome red flowers. East India.

H. coronarium. A stately species, with yellow flowers and handsome foliage. East India.

H. Gardnerianum grows to a height of 6 feet; flowers yellow, one of the best; a native of East India.

H. gracile. A dwarfer-habited sort than any of the preceding, bearing very handsome white flowers. It wants a little more heat than most of the species. Found in Bengal.

H. longifolium grows to a medium height and bears deep red flowers. From India.

H. thyrsiforme. A beautiful white-flowered kind that grows to a medium height. This is from Nepal.

INSECTS.—Hedychiums are little troubled with insects, their large smooth leaves not affording much harbour for them; red spider sometimes affects them, but can easily be removed by syringing with clean water. Should they become affected with scale, sponging is the best remedy.

HELICONIA.

These are herbaceous stove plants, nearly related to the Musas, but have much the appearance of Dieffenbachias. They have bold, handsome foliage, and are very effective among the fine-leaved section of plants, to which they belong. Their cultivation is similar to that of Dieffenbachias, which see.

H. aureo-striata. This species has large ovate-cordate leaves, the ground colour of which is dark green, profusely covered with broken yellow lines running from the midrib to the margin, producing a striking variegation. South Sea Islands.

H. metallica. A distinct-looking plant with ample foliage, the midrib and outer edges of which are reddish-brown, offering a perfect contrast to the rest of the surface; the under side is red. From the South Sea Islands.

H. vinosa. The leaves of this species are 18 inches long, green above, dull red beneath. In general appearance it is like a Canna with unusually large foliage. New Grenada.

HELIOTROPIUM.

Greenhouse plants, well known and so generally esteemed for the fragrance of their flowers as to be universal favourites.

Their cultivation is extremely simple. Cuttings of the young shoots in a soft state, such as can be had almost any time through the spring, root in a week or two in a temperature of 60° or 65°, kept close, moist, and shaded. If put in several together in pots filled with sand towards the end of March, they will be in a condition to pot off singly by the middle of April; give them good turfy loam, with some leaf-mould and sand added. Keep them in a growing temperature such as afforded by a pit with a little fire-heat until the plants have got established, standing them near the glass, with a little shade in bright weather. Stop the points of the shoots, and give more air as they begin to grow away freely; in five or six weeks move the young plants into 6-inch pots, in soil similar to that in which they were first potted; again pinch out the shoots. Treatment such as given to the general occupants of the greenhouse is all that is necessary after this. Their free disposition to flower is such that they will bloom in a very small state, and their receiving more root-room depends on the size they are required to be grown to; pots 7 or 8 inches in diameter will be enough to keep them blooming through the autumn, especially if they are assisted with manure-water. If required to bloom in winter they must have a little fire-heat so as to keep the night temperature from 45° to 50°, with a proportionate rise in the day as the weather admits of it. Plants kept through the winter in a cool greenhouse temperature will flower freely in spring with the increased sun-heat. If the old plants are kept on another season they will need more root-room; the size of the pots being increased, they will go on for many years until they reach the size of large bushes, or standards if prepared by confining them to single stems, removing the side shoots and then stopping them so as to form bushy heads. Heliotropes also answer well planted out, and grown bush fashion, or trained to a pillar or rafter, or covering a wall.

The following are good varieties:—

H. Duchess of Edinburgh. Dark purple.

H. Lady Molesworth. Purple.

H. President Garfield. A fine, free-blooming kind.

H. Swanley Giant. A rose-coloured variety, that bears large heads of flower.

H. The Queen. Pale lilac; very sweet scented.

INSECTS.—Aphides often are troublesome on Heliotropes; the best remedy is fumigation.

HEMIANDRA.

These are evergreen greenhouse plants found in New Holland, and the vicinity of the Swan River; they are inferior to many of like habit that come from the same parts. They succeed with treatment such as advised for Eriostemons, which see.

The following are the most distinct:—

H. emarginata. Flowers white and pink.

H. pungens.

H. rupestris. White.

These are all spring bloomers.

HEXACENTRIS MYSORENSIS.

There are few more handsome stove-climbing plants, and none more distinct, than the Mysore Hexacentris, which when it first bloomed produced quite a sensation. Its curiously shaped crimson and yellow flowers, in long pendulous racemes, are seen to best advantage drooping from the roof of a moderately cool stove. It is one of the freest of free-growers, and will even thrive under conditions as regards treatment which would be fatal to plants of a more delicate constitution. Although a free grower, however, it is easily kept within reasonable bounds, inasmuch as it will bear pruning better than most plants. It is not very generally cultivated, and the reason for this probably is that, being a native of Mysore, many have been led to suppose that it required more heat than has proved conducive to its blooming freely. As has frequently occurred in the case of other plants, cultivators have been left in the unfortunate position of knowing nothing about the locality in which it is found wild; but as it evidently does better with somewhat cooler treatment than many things we have from the same country, we should suppose that it must have come from an elevated district. When well-grown, its drooping flower-spikes extend to as much as 15 inches in length. It is best adapted for draping the rafters of the house in which it is cultivated, or it may be trained during the growing season on thin twine near the glass, where it will be fully under the influence of light, and then trained on a trellis like the twining Clerodendrons. It is a quick grower, and can be got to a considerable size in a single season. It may either be planted out or grown in a large pot. We prefer the latter, as so managed it attains a size sufficient for all ordinary purposes, and being a free-rooting subject, it quickly exhausts the soil, which can be more readily renewed under pot culture than when planted out. It appears to be a plant that under cultivation has no fixed season of blooming. We have had flowers in abundance through the winter and early spring months on growth produced the preceding summer, well ripened up during the autumn and slightly rested. We have also succeeded in having plenty of flowers during the late summer and autumn on the current season's growth without any previous rest; but, to effect this, it must be in a thoroughly light house, with little shade, more air, and less moisture than the majority of stove plants need, and also not too much heat, otherwise it keeps on growing without seeming to have time to flower until checked.

The ripening process should be effected by a drier state of both atmosphere and soil. Plants that have been rested through the autumn or winter in a temperature of about 55° at night soon commence to grow when subjected to 5° or 10° more warmth and produce abundance of cuttings. These should be taken off with a heel of firm wood attached to them when about 6 inches long, inserted singly in small pots, two-thirds filled with sandy loam, the remaining portion pure sand, kept moist and covered with a propagating glass in a temperature of 70°. They will root in a few weeks, when they may be gradually inured to the full air of the house, and when sufficient roots have been formed (which will be by the beginning or middle of May) they may be moved to 6-inch pots, well drained and filled with good fibrous loam, to which should be added enough sand to allow the water to pass away freely. The plant appears to grow equally well in either peat or loam, but we prefer loam through all stages of its growth, as in it it has a less disposition to make wood, and is more inclined to flower. When the plants have attained a foot in height, pinch out the points to induce the production of several shoots, which should be kept regularly trained round four or five tall sticks inserted in the pots for the purpose. Keep them now tolerably near the glass in an ordinary stove temperature day and night, or if they can be accommodated in a temperature a few degrees cooler, all the better. Sixty degrees at night is sufficient with 80° in the day, but a few degrees either way matters not, provided the plants are where they can receive a little more air with a drier atmosphere than the generality of stove plants are treated to at the present day. Syringe freely overhead every afternoon, and use a slight shade in the brightest part of the day if the leaves are found to scorch, not otherwise. By the middle of July the roots will have filled the pots, when the plants can be moved to others 3 inches larger, the soil used now being a little rougher than before, but of a similar nature. Keep the shoots regularly trained round the sticks; if this is not done they are sure to get entangled. Continue the same treatment as before until the beginning of September, when syringing should be stopped. More air ought to be given now and less water at the roots, so as to gradually induce a state of rest. Through the winter keep them at from 50° to 55° by night and a few degrees higher in the daytime, with no more water than will just prevent the leaves flagging. About the middle or end of February increase the temperature 5° day and night, and as soon as the plants begin to grow they may have a large shift—a 16 or 18 inch pot will not be too much—using the loam in a lumpy state; if destined to be grown as roof-climbers the shoots should be trained under the rafters, or in whatever position they are to occupy. Be careful not to over-water, as it will take some time for the roots to fairly enter the large body of new soil. Admit sufficient air during the day through the spring, but avoid cold draughts, and syringe freely at the time of closing the house in the afternoon. As the sun's power increases give a little more heat, but no more shade than seems absolutely necessary.

Continue to train the shoots as they advance in growth, treating the plants in other respects through the summer as in the preceding year; in autumn give more air, withholding atmospheric moisture and reduce the amount at the roots, so far as can be done without injuring the foliage. Let the treatment through the winter be the same as before. Again, as the days lengthen in spring increase the heat and give more water, which will at once induce the plants to break freely from the greater portion of the last summer's shoots, from the points of which before they extend far the flower-spikes will make their appearance. From this time liquid manure twice a week will be of considerable assistance. The syringe must now be used with caution, or it may cause the flower-buds to fall off. Do not keep the plants too hot while flowering, and when the blooming is over allow them to get sufficiently dry at the roots to cause the leaves to flag at intervals of a fortnight or so, after which they must be cut freely back, and at once turned out of the pots, removing half the old soil, and cutting in the roots freely. This, from its free-rooting character, the plant will bear as well as an Allamanda. They may be either returned to the same pots, or, if required to fill a large space, transferred to others a size or two larger, after which encourage them to make plenty of growth during the summer, to stimulate which give manure-water once a week. Manage through the autumn and winter as before. Again, when the spring flowering is over, repeat the cutting back and partial dis-rooting, with renewal of the soil. Should the plants be required to flower on trellises, all that is necessary is to take the shoots down from the position where they have been grown near the roof and to train them on the trellises before growth commences in the spring. After blooming cut back and repot, and place them where the shoots can be trained near the glass as previously. This Hexacentris is a plant so easily raised and so quickly grown to a considerable size, that it is not advisable to keep old specimens too long, younger examples being preferable.

H. lutea has lighter-coloured flowers than H. mysorensis, to which it forms a suitable companion; it requires the same treatment. Also from Mysore.

INSECTS.—Hexacentris are somewhat subject to red spider if the syringe is used insufficiently, but if the plants are freely damped overhead every day during the growing season, as advised, this insect will have little chance of gaining a footing. If affected with mealy bug or scale, dip and wash in a strong solution of insecticide when the plants are cut back after flowering.

HIBBERTIA.

Most of the species of this genus are low growing evergreen shrubs, but a few are climbers, also evergreen, suitable for a greenhouse or conservatory, and are effective when in bloom. They are distinct-looking plants, and can be propagated and grown on in the way recommended for Kennedyas, which see.

The undermentioned are climbers :—

H. Cunninghamii. A yellow-flowered species that blooms in summer. From King George's Sound.

H. dentata. Also has yellow flowers, produced in summer. From New Holland.

H. volubilis. Flowers yellow; a summer bloomer. From the Cape of Good Hope.

HIBISCUS.

Those most suitable for growing in pots are the rosa sinensis section; as they come from India and the South Sea Islands, they require a good deal of warmth. They are evergreen, and attain considerable height, but their free-blooming disposition, flowering as they do when not more than a few inches high in small pots, renders them desirable plants for indoor cultivation, especially as they are easily propagated by means of cuttings. They also bear pruning well, breaking readily when freely cut back, and in this way they may be kept for some time within a pot of moderate size. The individual flowers of the single as well as the double, or, more properly speaking, semi-double varieties are very effective; in shape they are not unlike those of a Petunia, but much larger. The time of flowering differs considerably according to the manner in which they are treated, but they usually bloom through the summer and autumn months.

Propagation is effected by means of cuttings, which, as we have said, strike readily in sufficient heat at any time when bits of half-ripened wood can be obtained. The most suitable shoots for rooting quickly can be got from plants that have been cut back about the close of the year, and afterwards kept in a temperature of 65° by night, and correspondingly warmer in the daytime. Thus treated they break freely. When the shoots are about 4 inches long they should be taken off with a heel and placed singly in small pots, half filled with sandy soil, the upper portion consisting wholly of sand. They should then be placed in a frame or under propagating glasses, where they can be kept close and moderately moist, conditions under which they will root in a few weeks. As soon as they are well furnished with roots, move them into 4-inch or 6-inch pots; they will succeed in either peat or loam, but, as with most free-growing subjects of a similar character, we prefer loam where it can be had of a good, turfy character, as in it strong-growing plants almost invariably evince a disposition to produce flowers more freely with less wood-growth than when cultivated in peat. Increase the heat of the house or pit in which they are placed as the days lengthen, and give them plenty of light with air in proportion to the temperature and state of the weather; use a little shade in the middle of the day and syringe freely overhead in the afternoons. When the young plants have fairly started into growth, pinch out the points to induce them to break back. Through the season they require nothing different from the general occupants of a warm stove. Even this first season many of them may be expected to produce flowers, and when standing as in this state they ought to be on the side stages of the stove, they form conspicuous objects.

After the blooming is over shorten them back a little, and as soon as they have broken, shift them into pots 3 inches or 4 inches larger than those they have been in, using soil similar to that just named, with sufficient sand added to keep it in a healthy open condition. Through the autumn months subject them to drier treatment, both as regards the atmosphere and soil; winter in a temperature of 60° by night, or a few degrees higher will suit them better. Their management during the ensuing spring and summer will require to be such as recommended for the preceding year, except that no stopping should be attempted except with the view of inducing a portion of the plants to bloom later. After they have again flowered, the shoots should be shortened back more or less, according to the size to which the plants are to be grown; but there is no state in which they are more useful than when confined to small pots. A sufficient stock should be propagated yearly, and the plants may be discarded after their third season's blooming. Where it is desirable to grow them on longer, after they have fairly broken they should be turned out of their pots, as much of the surface soil should be removed as can be done without disturbing the roots in a way likely to injure the foliage, and they should be repotted in soil similar to that in which they have been grown; the size of pot should be determined by the size which the plants are desired to attain. They are free rooters, and will bear a shift of 8 inches or 10 inches without any danger of the soil becoming sour. The larger the plants the greater quantity of flowers will they produce; and in this way, with additional root-room, they may be increased in size for several years. Where space is limited, they can be kept in a healthy condition with their roots somewhat restricted, this confinement being compensated for by the frequent use of manure-water during the growing season.

There are numbers of species and varieties known to cultivators; the following are a selection of the most noteworthy; amongst them are several of the H. Rosa sinensis varieties, which are the most effective for ordinary cultivation:—

H. Cameronii. This is a shrubby-habited plant from Madagascar; it is a tall grower. The flowers are straw-coloured, with purple spots.

H. marmoratus. A small-flowered species. The flowers are white, spotted with rose. A native of Mexico.

H. Rosa sinensis brilliantissimus. Has large-sized reddish-scarlet flowers, deeper coloured towards the lower part of the petals.

H. Rosa sinensis Collerii. A particularly free-blooming sort, with yellow or buff flowers, the lower portion of the petals red. From the South Sea Islands.

H. Rosa sinensis Dennisonii. A close, dense-growing kind, with creamy-white flowers of large size. A fine sort.

H. Rosa sinensis miniatus semi-plenus. This plant has handsome stout foliage and bears freely its large semi-double flowers, which are vermilion-scarlet in colour; the petals are elegantly waved in their outer edge, and not unlike a double Petunia; the stamens, which protrude between the petals, enhance the appearance of the flowers. South Sea Islands.

H. Rosa sinensis schizopetalus. Is a most singular and distinct-looking plant from Tropical Africa. The flowers are drooping, suspended on long stalks; the petals, few in number, are deeply pinnatifid; the flowers are red. It has a most elegant effect when in bloom.

H. Rosa sinensis zebrinus. The individual flowers of this sort are smaller than those of most of the other kinds; they are quite double, and the back petals are red, edged with yellow. A distinct and handsome sort.

INSECTS.—Like most plants that require a high temperature, Hibiscus are subject to the attacks of insects; the leaves especially, if the plants are allowed to want for water either at the root or overhead, are liable to suffer from red spider, but if the syringe is regularly used and sufficient care taken that the water effectually reaches the undersides of the foliage, this troublesome little parasite cannot get a footing. Where it happens to exist, we have found the best remedy to be a weak solution of insecticide, which the plants should be either dipped in or syringed with, so that every portion is reached by the mixture. Greenfly sometimes makes its appearance on the young shoots, for which either dip in tobacco water or fumigate. Should they become affected with scale or mealy bug, sponging must be resorted to, as, except when the plants have been cut back and are denuded of their tender foliage, the leaves will scarcely bear any dressing strong enough to kill the insects.

HIPPOMANE SPINOSA

An erect-growing evergreen stove plant that in its native country attains the dimensions of a moderate-sized tree. It has handsome green foliage, with prominent spines on the leaves.

It requires the same treatment as recommended for Theophrasta, which see. A native of the West Indies

HOVEA.

These beautiful pea-flowered evergreen greenhouse plants, natives of New Holland, are not difficult to grow, possessing a much stronger constitution than the generality of subjects from the same region that are usually cultivated as pot plants. Hovea Celsii, which is the plant more particularly treated of here, is one of the most beautiful coloured flowering plants we possess; its blossoms are bright bluish purple, produced freely from the axils of the leaves of the preceding season's wood. Its foliage and general habit are also quite distinct, rendering it a most desirable subject for growing in any collection of hardwooded plants having pretensions to being complete. That it is now so seldom seen can only be attributed to the great number of novelties that within the last quarter of a century have been introduced to the country, for the time putting many deserving plants in the background. These, however, must ultimately regain their former favour through sheer merit, especially this plant, from the fact of its adaptability to pot specimen culture, and its being one of the best plants for growing at the end or on the roof of a cool conservatory. It is proverbially a slow grower, and with fair treatment it will last a long time, not being subject to go off quickly from causes difficult of explanation.

In growing the plant up for a specimen of the ordinary bush-like shape, two distinct methods may be followed. We will allude first to the more general way of treating it.

In selecting plants for this method more care is necessary than with most things to secure such as have been stopped not more than 3 or 4 inches above the collar, for it is a most determined upright grower, and if it has been allowed in its first stages to run up too high before stopping, the habit is hard to correct.

Hoveas can be increased either by cuttings of the half-ripened shoots or from seeds; the latter method is preferable. Sow in February, in shallow pans, drained and filled with fine peat and sand, covering the seeds about a quarter of an inch, pressing the material firmly down. Keep slightly moist in an intermediate heat, put a sheet of glass over the pans to keep the surface moist, and shade with tissue paper. As soon as the young plants are up remove the glass, but continue the shading when the sun is powerful; keep near the light, give some air, and syringe overhead, but not so much as to make the soil too wet. By the end of July the plants should be big enough to put singly into small pots, using soil similar to that in which the seed was sown; continue the treatment to encourage growth until the middle of September, when reduce the night temperature to 45°, at which keep through the winter. About the beginning of March pinch out the points to cause the plants to break side shoots, and in a few weeks afterwards move into 3 or 4 inch pots; treat them subsequently during the spring and summer somewhat warmer by the admission of less air than requisite for larger stock, with a moist condition of the atmosphere and a little shade in bright weather. When the young shoots formed after stopping have made three leaves, again pinch out the points, and treat through the autumn and winter as before. Early in spring give 6-inch pots, and stop the strongest shoots at the time of potting. The management during the spring should be the same as last year, stopping those shoots that seem to require it about the end of June, and treating onwards through the summer as hitherto. The young plants should now have eight or ten nice shoots. Keep them through the winter near the glass in a night temperature of 40° or 45°. Pick off any flowers they may be inclined to produce as early as they are large enough to get hold of. As soon as they show signs of growth give them a shift of an inch and a half or 2 inches: the slow growth of the plant will not admit of a large pot. It will grow in either good turfy yellow loam or peat—we prefer the latter, where it can be had good, possessing a fair share of fibre; to this add one sixth or seventh of silver sand, according to the quantity of it in the soil. Drain moderately, it is not a plant that requires a great deal of water; pot firm, tie out the shoots, but do not bring them too low or down to a positively horizontal position at first, or they will not be disposed to make much progress—its natural straight habit causing it to push out shoots from where it has been so bent, which will drain all the strength, starving the too low trained shoots so as to prevent their further progression. Place them in a light situation where they will have the air shut off early enough to close in some sun-heat, so as to induce early growth; pinch out the points of the shoots to cause them to break.

By the end of April, when the drying influence of the sun begins to be more felt, draw the syringe over them and damp the material on which they stand in the afternoons. When growth has fairly commenced and made some progress, if any shoots show a disposition to run away with more than their share of strength, keep such regulated by further tying down, or they will rob the rest. It is necessary to be more careful in this matter with this plant than with most others, for its slow disposition of growth does not admit of any considerable amount of wood being cut away. Its leaves, being naturally hard in texture, lose little by evaporation, and consequently require little shade after this stage has been reached, even in hot weather; yet it and others of similar nature, when grown with plants which do want shade, are not injured by it unless too much is applied. Treat through the summer as to water and closing in sun-heat, with a damp night atmosphere, until the end of August, when more air may be given, and the plants prepared for winter. As will be seen, no second potting during the season is recommended for it, its nature neither requiring nor permitting of such. Winter as advised the preceding seasons. We should again advise the removal of the flowers as soon as they are large enough to be got at. As before, when signs of growth are apparent, move into pots 2 inches larger, stopping the points of the shoots and tying them down lower, as also any that have been formed near the centre and show a disposition to monopolise more than their share of sap; treat as in the preceding summer, again hardening up the growth in autumn by more air and a drier atmosphere. Tie nicely out with a few thin sticks to the principal branches—it does not require nearly so much support in this way as most plants—and draw the weaker shoots into the places they are required. In the spring they will make nice decorative plants, and when in flower through April and May they can be removed to the conservatory or show-house, where the presence of this and similar hardwooded subjects gives a character which the employment of softwooded things alone does not. Let them here have a light front position, where they will not be too much crowded, and as soon as the beauty of their flowers is over, move them back to their growing quarters; stop and pot as in the preceding seasons, giving again a 2-inch shift—more than which this plant rarely requires. The future treatment each succeeding year may be similar to that so far advised, care being taken not to overpot, or to pot at all unless the soil is well filled with roots.

Another method of treating this Hovea is to grow it on without stopping, letting it assume its natural form, which will be to run up a considerable height before it branches much. Its treatment in respect to potting, soil, and other matters may be similar in every way to the foregoing, with the exception of its not being stopped or trained, only just a single stick being used to support it. It may also with advantage be kept a little warmer through the winter and spring, the object being to get as strong a plant as possible in little time, with plenty of roots, and, when it is grown into such, to head it down, when the root-power it possesses will cause it to break up a number of shoots all round the collar, that make much more progress than is possible with a young plant trained from the first. By far the best specimens of it we have seen have been so obtained; its natural disposition for growing up in a thin, straggling way is by this means best corrected.

After heading down (which should be done about the beginning of March), place the plants in an intermediate temperature, near the light. Do not give more water than just sufficient to keep the soil from getting over-dry until after they have broken an inch or two; draw the syringe over them on the afternoons of dry days. Growth from stools of this description will be much more rapid than from young plants. When the shoots have pushed 8 or 9 inches, which they will have done by the middle of June, train them out, the strongest to the outside, and pinch out the points, so as to induce them to branch and form compact growth. The plants, unless they have been somewhat pot-bound, will not require a shift until the spring following, when they should receive it as early in the season as they show signs of growth; it is better to take out the flowers, and treat as before through the summer, in stopping, training, air, and water. If all goes well, by the autumn they will have made growth 18 inches in length from the base, strong and bushy; harden up by the admission of more air after the middle of August, and tie with a few thin sticks. With proper attention as to water and repotting, when such is required, plants so treated will last and keep improving for years.

The natural disposition of this Hovea to run up for a considerable height with a single stem, renders it, as already said, well adapted for occupying a limited space on a conservatory roof or as a pillar plant. In cases where it is so employed, it should be from the seed-pan or cutting-pot trained to a single stem, without branching until it gets high enough for the place required, when the point must be pinched out, as the head is formed training it in the desired shape. It shows best when allowed to grow comparatively loose; in this way it will bloom profusely and ripen quantities of seed, which will, from its scarcity, be of considerable value. Any one who has never seen the plant so grown can form no idea of its beauty and the size it will attain.

H. pungens is somewhat dissimilar to the above, very slender in appearance, but not so large a grower, and is not fit for any purpose other than as a moderate-sized pot specimen, for which it is well adapted, its colour, also deep bluish purple, harmonising well with most other inhabitants of the hardwooded house.

INSECTS.—So far as we have seen, Hoveas are subjects upon which mildew will not exist; nor are they much liable to the attacks of insects. Red spider will live upon them, but they are not often attacked by it; here, however, as in most other cases, prevention is better than cure, and this can easily be secured by using the syringe well to the underside of the leaves once a week, through the hottest part of summer. Scale will live and increase fast upon them, especially the white species, consequently they should never be allowed to come in contact with any plant affected with this worst of insects. On these, as with most hardwooded plants, brown scale can be destroyed by washing in the autumn when growth is completed, and before the bloom is prominent, with insecticide.

HOYA.

(Stove.)

The individual species of these fine flowering plants are very different in their appearance, as they also are in the treatment they require, from the strong-growing, heat-loving H. imperialis from Borneo, which is a twiner, to the most elegant dwarf shrubby H. bella, which hails from Taung Kola. They are very distinct and beautiful plants, easy of cultivation, and have the advantage over many things of a twining or climbing habit, in not being too rampant in growth—consequently the twining species are suitable for places where plants of larger size would be less manageable. They are appropriate for clothing pillars and rafters, or for training longitudinally over the paths in the stove. Grown in the latter position their flowers droop so as to be seen to the best advantage. In most of the species they are borne in bunches, upon stout, persistent spurs, that issue from the base of the leaf-stalks at intervals up the stems. These make their appearance as the young shoots are formed, lasting for many years, and from them are emitted the flowers—two or three times in the course of the season in the case of some kinds. There is one matter that should be observed in the cultivation of these persistent-spurred kinds: that is, if the flowers are cut for bouquets or similar purposes, on no account should the spurs be removed with them, or it necessarily follows that the blooming capabilities are so far reduced as to make the future supply be dependent on the formation of fresh spurs, which are only produced upon the young shoots. It is requisite to mention this for the guidance of beginners in the culture of Hoyas, as we have known large specimens, when in the hands of the inexperienced, completely stripped of their blooming spurs, which had taken years to form, causing them to be comparatively flowerless until fresh growths had been made—thus entailing much disappointment, as in most cases it necessitated the plants being headed down.

Amongst the twining species that need a warm temperature the foremost place is held by H. imperialis. This is a native of Borneo; it is a strong-growing plant with ample thick leathery leaves, and bears very large bunches of pale brown and yellow flowers. With this may be associated, in the general treatment they require, the Cinnamon-leaved Hoya, H. cinnamomifolia, a plant of medium growth, with pale green and chocolate flowers; the bell-flowered Hoya, H. campanulata, which bears greenish-yellow flowers: both these are from Java; and H. Cunninghamii, also a handsome species. They strike freely at almost any time of the year, but if put in about April get well established in their pots before the summer is over; if at this time cuttings are made from the preceding summer's shoots, using two, three, or more joints, and they are inserted singly in 3-inch pots in half loam and sand, they will root in a few weeks placed in a temperature of 70°. They need not be kept nearly so close as things with softer leaves, that would flag if not in a confined damp atmosphere. When well rooted, move them into 6-inch pots. They will grow in almost any description of soil, but loam is the most suitable, as it is not so liable to get sour as peat is ; it should be of a turfy nature, and have a liberal quantity of sand added, for although the plants are anything but of a tender character, still if the soil ever gets in a condition that the water cannot pass freely from it the roots are almost sure to perish. Through the summer the night temperature should be about 70°, with 10° more in the day, giving air according to the state of the weather. Reduce the heat in autumn, and through the winter 60° by night will do, keeping the plants drier at the roots. About the end of February give more warmth, and move into pots a few inches larger, according to the strength of the different species. Increase the heat as the season goes on. They will flower more or less during the summer, but not so as to make the display that may be looked for when they have acquired more size. As soon as the blooms begin to show on the ends of the spurs, cease syringing overhead, as water sometimes causes the young buds to drop before opening. As a matter of course they will now be placed where they are intended to grow, which may be over a path, up a rafter, or round a pillar ; they can likewise be used as trained specimens when required. However employed, they are better in pots than planted out. All that is further needed is to give more pot-room as this is wanted, and to treat through the winter and summer as already advised. The plants will last for many years.

H. bella and H. Paxtonii are small-growing shrubby plants of a half procumbent habit, and their beautiful pearly white and pink flowers are produced freely in the spring and summer; they strike readily in spring from cuttings made of the points of the shoots, consisting of several joints, treated like the other sorts. These do not require large pots—such as are 10 or 12 inches in diameter will be found big enough for most purposes. Like all the species, they must have plenty of light when growing, and not too much moisture either in the atmosphere or at the root. When flowering they require to be supported by a moderate number of neat sticks, otherwise the branches will lie quite flat, but they should by no means be subjected to the stiff, formal training sometimes seen by placing them on trellises, as it completely destroys the elegant appearance the plants have when allowed to assume more of their natural form. [illegible] pots wherein these two kinds are grown must be well drained ; they like a moderate quantity of water both to the roots and overhead when growing, but must not receive too much in the winter. They will bear the shoots shortening in moderately after flowering, when the growth has got larger than is requisite. They should be kept in a temperature of 60° when at rest during the winter. Both these sorts are peculiarly adapted for growing in 8 or 10 inch pots suspended from the roof over the paths in the stove, where there is sufficient head-room ; the flowers in such a position are very effective. These two kinds may be used freely for cutting, as they yearly produce a profusion of bloom-spurs. Their delicate-coloured flowers have a charming effect when mixed with almost anything else.

The following are likewise desirable sorts, that will succeed under similar treatment :—

H. globulosa. This has thick leathery foliage, of moderate size ; the flowers are straw-coloured, produced freely. It has the appearance of being a handsome, distinct kind. India.

H. lasiantha. Flowers pale orange and white ; foliage bold and handsome. From Borneo.

H. linearis. A distinct new species, with slender branches and long, narrow leaves. Flowers produced at the points of the shoots, white, with pink centre. A suitable plant for a hanging basket. From the Himalaya.

H. pallidiflora. Is a small-growing species, with white flowers. Java.

H. Shepherdii. A distinct-habited plant, with stout foliage ; the flowers are suffused with rose. A native of India.

INSECTS.—Thrips and red spider will sometimes make their appearance upon them, especially if the atmosphere is kept very dry for a considerable time during the growing season ; but a weak solution of insecticide will be found an effectual cure. Scale and mealy bug must be kept under by syringing with stronger applications of insecticide when at rest, but it should be kept away from the roots. In the growing season syringe with clean warm water and sponge the leaves and shoots.

HOYA.

(Greenhouse.)

The flesh-coloured Hoya, H. carnosa, from China, and the variegated varieties of this species, H. carnosa picta and H. carnosa variegata (which are similar in habit of growth, differing from the normal type in having variegated leaves), will thrive in a greenhouse. They are medium growers, and may be either used for draping a pillar or rafter, or as trained specimens, in which case they are best grown on a wire trellis. Their propagation and after treatment is similar to that advised for the twining stove species, except that they require less heat, and, growing slower, are longer before they need putting in full-sized pots.

HUMEA ELEGANS.

This well-known greenhouse biennial is, when well grown, one of the most elegant objects that can be introduced to a conservatory or cool plant-house. It is raised from seed, which should be sown during spring in pots filled with loam, to which has been added some sand and leaf-mould. Stand in a little warmth, if such is available, until the seeds have vegetated; if not, in a greenhouse. When the plants are large enough move them singly into 3-inch pots, and as soon as they get established place them near the glass. A pit or frame will answer during the summer, where they can get plenty of light and air, being careful never to let them suffer for want of water. Directly the pots are full of roots move into others 4 inches larger, and syringe overhead daily; about August it will be well to give them a shift into 9 or 10 inch pots, as if cramped for root-room the lower leaves will be injured and the appearance of the plants spoilt. Winter in an ordinary greenhouse temperature in a light position, so as to keep the growth short and stocky. If large examples are required, they should be moved to pots 2 or 3 inches larger in spring, and as soon as the soil is moderately full of roots give manure-water once or twice a week, treating in other respects as in the previous summer. When in bloom they will keep for many weeks in good condition, their grass-like plumes of diminutive, distinct-coloured flowers having a beautiful appearance. As already said, the plant is a biennial, consequently to keep up the stock seed should be sown every spring. It has a strong aromatic perfume. Introduced from Australia.

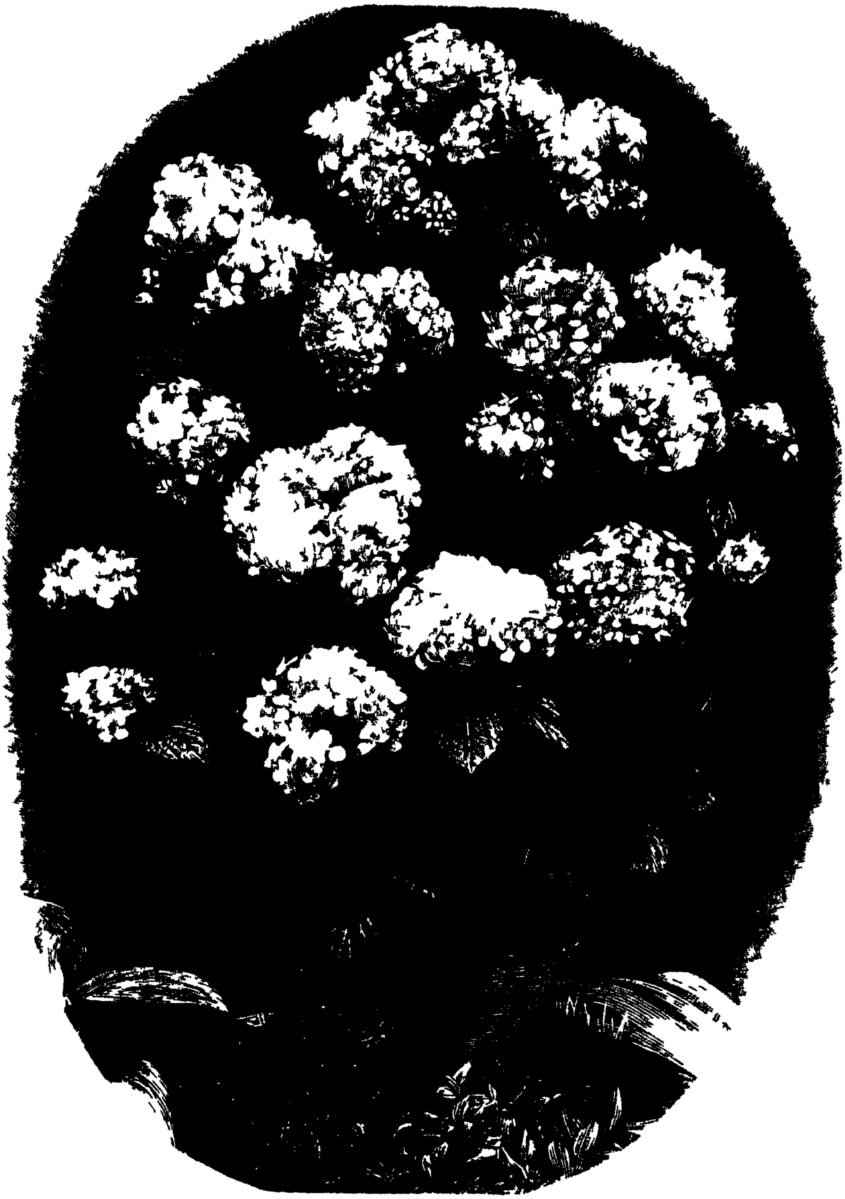
INSECTS.—Red spider and aphides are both partial to this Humea; to keep down the former the leaves should be syringed daily through the growing season, getting the water well to the under side. On the first appearance of aphides fumigate, as if the insects are allowed to remain even for a short time the leaves will be spoilt.

HYDRANGEA.

The fact that many of those engaged in gardening pursuits are led in the selection of what they grow much more by a plant's being new or rare than by its possessing the real merits of producing handsome long-enduring flowers freely, with a vigorous constitution that makes its cultivation easy and success comparatively certain, is always forced upon us whenever we see a well-bloomed example of Hydrangea.

The genus is found dispersed over a wide expanse of both the eastern and western hemispheres, in China, Japan, and the mountain ranges of Northern India, in both the Eastern and Southern States of America, Chili, and Peru, but it is to the Japanese or Chinese greenhouse species that we are the most indebted for subjects best adapted to pot-culture.

Those who live in distant parts of the country, on their first visit to Covent Garden Market, if such happens to be during the spring or early summer, see nothing that strikes them more forcibly than the numbers of Hydrangeas grown in small pots, not generally more than 6 or 7 inches in diameter. The plants grown to a single stem, 6 or 8 inches high, are furnished with three or four pairs of healthy leaves, surmounted by a globular head 12 or 15 inches through, generally of the freshest and clearest bright pink colour, although a few are met with possessing the blue shade that is so much prized by some, and for producing which there are several different recipes, in the shape of soil more or less impregnated with iron filings, charcoal, or alum, or pure peat. We have always found that if the plants were supplied with the large quantities of manure-water requisite to give size to the heads of flower, whatever the nature of the soil or ingredients added to it, the blooms when fully matured were pink of some shade. Larger specimens are grown for the London market bearing several heads of flower each, but for general decorative purposes the small plants with single heads are much the most to be preferred. In addition to the pleasing colour, general attractive character, and long endurance of the flowers, the plants possess the advantage that during the time they are in bloom they can be



Hydrangea.

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stood in places where there is comparatively little light, even under the shade of other plants, in positions that few if any other flowering subjects would bear without being so injured as to be useless afterwards.

There is a larger variety of the common form, with the individual flowers of which the head is composed, as well as the head itself, much bigger than the older more generally known kind. This is the best to grow, differing in no way as to the treatment it requires in propagation, soil, and time of flowering. Cuttings will strike at any time of the year that they can be obtained in a half or three parts ripened state, but to ensure the large heads on small plants such as above described, the best method is to have a few plants grown out in an open sunny situation, where they keep strong and short-jointed. These, according to the early or late character of each season, will generally get sufficiently matured to be taken off in August, at which time the buds will be formed in the points, in which state they should be taken off at about the third joint below the bud, and inserted either singly in small pots or several round the side of a 6-inch one. Place a few bits of crocks in the bottom of each, on these a little fibrous material, and dry or flaky rotten dung, such as has been used for mulching a Vine border or Asparagus bed. They are in no way particular as to soil, but if it is preferred to have some of a blue shade and others the normal colour, a portion may be struck and grown in sandy peat and the others in loam, in both cases using it for the cuttings in something like a proportion of one-fourth sand to the loam or peat. The cuttings should be severed at a joint, and inserted firmly in the soil, the leaves, except those at the base which must necessarily be removed, being retained. A slight hot-bed should be prepared, on which place an ordinary frame with glazed lights; in this plunge the pots, keeping them well moistened and shaded from the sun, but with the lights tilted night and day, so as to keep the tops cool, otherwise the heat will have a tendency to cause them to break into growth, and they would be spoilt for flowering in the dwarf state they are intended to assume. They will soon strike, after which the shading must be dispensed with, and when they are well furnished with roots at once remove them to 6-inch pots, in which they may be allowed to flower. Keep them quite cool through the autumn—any pit, frame, or house will answer, in which they will not get frozen—it is better not to subject them to frost; they will cast their leaves before winter, nothing remaining but the woody shoot with the bud at its extremity. But never allow the soil to become dry, or the roots will suffer. If desired, a portion of the plants may be had in bloom early by putting them in a moderate heat at Christmas, such as a vinery or peach-house at work, or anywhere where an intermediate temperature is kept up; here they will soon commence growing, making two or three pairs of leaves below the flowers. As soon as they begin growing freely those that are intended to come with pink flowers may be assisted once a week with moderately strong manure-water, which will cause the production of much larger heads of bloom; but, we have never been able to produce flowers of a decided blue colour if manure-water was used; when it has been given to them even when they were grown in all peat, or with alum or iron in the soil, they have come neither one thing or other, but a not very pleasing mixture of both. Such as are wanted later may be put in a little warmth, and some allowed to come on with the assistance of solar heat in an ordinary greenhouse temperature. So managed a succession of flowers can be kept up for six months. If suckers are produced at the base these should be removed until the plants come into flower. After the blooms have got shabby the shoots that have borne them may be cut out at the bottom, as suckers are sure to spring that will make more compact plants; plunge them out-of-doors for the summer, winter out of the reach of frost, and in the spring, just as they show signs of beginning to grow, head them right down to the bottom. They will quickly throw up shoots that will produce large heads of bloom on much shorter growth than if borne upon the old wood formed the preceding year. We have kept plants for three years in the same 6-inch pots they were first potted in without either change or addition of soil, simply by using manure-water during the time they were growing; in the second and third years they produced from three to half-a-dozen fine heads, showing what can be accomplished with the aid of liquid manure to such plants as will bear it—in this case they may be said to have been altogether supported by it, as the small quantity of soil in which the roots were placed must, after the first year, have become so exhausted as to be nothing more than a medium through which the liquid sustenance was conveyed to them. For anything perceptible in the appearance of the plants as to vigour and ability to produce flowers, they would have gone on longer without change or addition of soil, but the experiment was cut short through unforeseen circumstances.

If it is thought advisable to grow some on to a larger size, they should when done blooming be moved into pots proportionate to the size they are wanted to grow to, say 9 or 10 inches the first year; but for general use, to produce plants to flower in a small state with single heads, nothing equals the appearance of the autumn-struck cuttings that have been produced out-of-doors, for which the above two forms of H. hortensis are the best adapted.

The variegated forms of H. japonica, H. japonica argentea variegata, and H. japonica aurea variegata, are well worth cultivation for the beauty of their leaves, as well as the flowers they produce.

H. Otaksa. A very fine variety with large flowers, also suitable for pot-culture, like those already described, and of easy cultivation; it is propagated from half-ripe shoots and grown in ordinary soil, either peat or loam, with one-eighth sand to keep such thirsty subjects from getting sour and waterlogged; the plants should be exposed in the after part of summer in the open air to keep them dwarf and to get the wood ripened.

H. paniculata. A white-flowered beautiful species that does well under pot-culture; it is a most profuse free-blooming plant, that deserves to be generally known and much more generally grown than it is.

H. stellata flore-plena. Another fine Japanese variety, producing very large corymbs of double rose-coloured flowers, and is in every way a desirable plant; treatment same as for the preceding.

H. Thomas Hogg. A very handsome kind that has recently appeared. It is a free-flowerer, producing moderate-sized heads of white flowers.

The system of propagation and general treatment advised for the other species will answer for these, except that where the plants are required to be grown to a considerable size they must be encouraged by more pot-room.

With less trouble Hydrangeas may be struck from cuttings produced in spring from plants that have been flowered early; these should be taken off when they have three or four joints, and put singly in 3-inch pots filled with half sand and loam. Stood in an intermediate heat, kept close, moist, and shaded, they will root in a few weeks, when give more air and as soon as the pots are fairly filled with roots put in others from 6 to 8 inches in diameter, using good loam, well enriched with rotten manure and with some sand added. When well established in these move to the open air, and give water as required, through the summer; keep in a pit or frame away from frost during the winter until required for forcing, or in the greenhouse to come on with solar heat for later blooming.

INSECTS.—Hydrangeas are not much troubled with insects, except greenfly, which can be kept under by fumigating, dipping, or syringing with tobacco water

HYMENODIUM CRINITUM.

A small-growing very distinct stove Fern; the fronds are simple, that is without any divisions and about the size of a moderate example of Horse-radish, the surface studded over with black hairs. It is not elegant, but is desirable on account of its dissimilarity to other Ferns. It comes from the West Indies.

For propagation and cultivation, see Ferns, general details of culture.

HYMENOPHYLLUM.

A beautiful genus of dwarf-spreading Filmy Ferns, requiring cool treatment, and to be kept always moist at the roots, and also in a moist atmosphere, such as present when covered with a bell-glass. They do not like much warmth, nor very much light.

For propagation and cultivation, see Ferns, general details of culture

H. asplenioides.	West Indies.
H. caudiculatum	Brazil.
H. crispatum.	New Zealand.
H. demissum.	New Zealand.
H. exsectum.	
H. flabellatum.	New Zealand.
H. interruptum.	West Indies.
H. javanicum.	
H. multifidum.	New Zealand.
H. pectinatum.	Chili.
H. pulcherrimum.	New Zealand.
H. tunbridgense.	Britain.
H. unilaterale.	Britain.

IMANTOPHYLLUM.

These are fine flowering evergreen greenhouse plants of close compact growth, that may be had in bloom during a good portion of the year where there is a sufficient quantity to keep up a succession. They force well, and on this account can be brought into flower during the winter so as to precede such as are let to come on later in a greenhouse temperature. The flowers are produced in large umbels on erect fleshy stalks that issue from the crowns among the leaves; they are a pleasing combination of red and yellow, lasting for a considerable time, effective on the plant and useful for cutting.

The most usual method of increasing them is by division of the crowns, which should be effected in the spring, before they begin to grow; turn the plants out of the pots and shake away the soil so as to admit of their roots being separated with as little breakage as possible; then divide the crowns and place them singly in pots big enough to admit the roots they already possess, and others that will soon be formed, for Imantophyllums are free growers, and make roots almost as fast as Agapanthus umbellatus, which plant they are not unlike in habit of growth. Pot in good loam, to which add some sand, and at once put the plants in an intermediate heat if such is at hand, if not keep them close in a greenhouse with as little air as possible, so as to get them into growth quickly, for where the roots of any plant have been broken, as unavoidable in dividing the crowns, the injury is least where growth afterwards commences without delay. It will be an advantage to keep the plants moderately warm for two or three months, giving them plenty of light and water as needful to keep the soil well moistened until the growth is finished, after which they will do in any cool house or pit at liberty. Imantophyllums require no more shade than such as may be found needful to keep the leaves from burning, which seldom occurs.

Winter in a temperature such as the generality of greenhouse plants require, and in the spring move them into pots 3 or 4 inches larger. Ordinary greenhouse treatment will now suffice, but they increase in size more quickly if kept a little warmer through the earlier part of the spring and summer, during which time all that are strong enough will flower. A continuance of the treatment so far advised, will suffice to keep them in health, giving pot-room proportionate to the size the plants are required to be grown to. Large specimens in 15 or 16 inch pots yield a quantity of flowers annually, but in most cases smaller examples will be more useful. If when the plants get too large a medium size is preferred rather than single crowns, they may be divided into two or three in place of being more reduced in size. When to be forced so as to bloom early in the spring, strong plants should be put in ordinary stove heat about January, and kept well supplied with water, and they will soon be induced to push up their flower-stems. The flowers will last longer if the plants are kept moderately cool when in bloom. During the winter season comparatively little water is required, either in the case of large or small specimens.

I. Aitonii. Flowers red and yellow; blooms during summer, sooner or later, according as it is cool or warmer. Cape of Good Hope.

I. miniatum. A pretty red and yellow flowered kind. Africa.

I. miniatum splendens. A highly-coloured variety of the last-named.

I. miniatum var. Martha Reimers. A large, massive-flowered variety, an improvement on the older kinds.

INSECTS.—Imantophyllums are not much troubled with insects, their smooth, hard, leathery leaves not affording much harbour to them; should any of the different species of these pests at all affect them, syringing and sponging will be found sufficient for their removal.

IMPATIENS.

Though very different from the common Balsam of our gardens in general appearance, I. Jerdoniæ, which is a stove plant, is botanically nearly related to it. To those who love and grow flowers for their own sakes, it is frequently a matter of surprise that plants, beautiful in themselves, very distinct in character, and, as one might suppose, possessing every property to recommend them for growing generally, should too frequently, through caprice, fashion, or some unknown cause, be allowed to go almost out of cultivation. Such has been the case with the plant in question. When first introduced, if our memory serves us rightly, some thirty years or so ago, it quickly became a favourite, so much so, that few people possessing a stove were without it. Its compact habit and profuse disposition to flower were such as to place it within the means of culture of those who had little heated glass space. Another advantage possessed by it is that it does not require great heat, but there is one matter connected with its cultivation essential to its very existence, and that is that in the winter when at rest, and all but denuded of leaves, it must be kept very dry at the root, in a comparatively dry atmosphere, and near the light, otherwise its succulent stems are apt to decay. The whole texture of the stem and branches of the plant is very similar as regards their fleshy character to the ordinary Balsam in general cultivation, consequently it will be seen that in propagation the cuttings will not do to be kept too close or confined, and they must have comparatively little moisture about them. It is best propagated in the spring about the beginning of March; take for cuttings portions of the preceding season's mature growths, as in the case of a healthy plant these branch out freely, attaining during the season a length of from 4 inches to 10 inches. The smaller size severed at the base will be found most suitable. They should be inserted singly in, or two or three together round the sides of, small pots well drained and half filled with a mixture consisting of equal proportions of fine peat and sand, the upper portion all sand. The sand must not be made more than very slightly damp—in that condition best described as neither wet nor dry, a state in which it must be kept until the cuttings have formed roots. As before said, they must not be subjected to close confinement in a frame or under propagating glasses, or they are almost certain to become a rotten mass. They do best on a shelf near the roof or set close to the upright front or end glass of the house or pit in a temperature of 60°. Thus treated, they will in a few weeks freely emit roots, the presence of which will be indicated by the points of the shoots beginning to grow. If the cultivator is anxious to get the plants on in size quickly, two or three of the newly-struck cuttings may be placed together in a 3-inch pot, or singly if deemed preferable. This Balsam succeeds best in material of a light, open nature, partaking more of the character of that in which Orchids are grown, than in any compost more retentive. Two parts good fibrous peat added to one of chopped sphagnum, with which is mixed a liberal sprinkling of charcoal, broken to the size of horse beans, and some silver sand, will answer perfectly. The pots should be one-fourth filled with crocks or charcoal for drainage, and the material ought to be pressed moderately close round the roots. The temperature may be raised as solar heat increases, but the plant after rooting never requires so much warmth as many stove subjects; the heat kept up in an intermediate house suits it best. It will also do with more air than is liked by the generality of stove plants. The nearer it is kept to the glass the better, and a very thin shade should be used in the middle of the day during bright weather. Through the season of growth it will bear watering at the root freely, and will also be benefited by syringing overhead once a day, but this should be done early enough in the afternoon to allow the moisture to get dried up before nightfall. By midsummer sufficient root progress will have been made to admit of the young stock being transferred to pots an inch or two larger; or, in the case where two or three were put together and are intended to be grown so, they will bear a little larger shift. It is naturally of a bushy habit, to still further assist which the points of the growths may be taken out, but every operation of this kind should be done with the knife, as a bruise resulting from pinching is not unlikely to cause the shoots to rot. The singular-shaped yellow and pink-tinged flowers are produced so freely that the plants will bloom the first summer or autumn. After the flowers are faded pick them off and dispense with shading as the sun begins to decline in power, at the same time reducing the temperature of the house; they must also be kept drier at the root and not syringed at all. During the growing season a shelf near the roof will be the most suitable position for them; winter in a house or pit where the night temperature is about 55°, giving very little water from the time they cease to grow. In fact, the soil through the whole season of rest should be kept, as to moisture, much in the same condition as that of the majority of Mexican Orchids during their dormant period. Towards the end of February give a little additional warmth with more moisture in the atmosphere, and as soon as growth commences more water to the soil. By the beginning of April the roots will commence to fairly extend, and pots 2 inches or 3 inches larger may be given, using soil similar in character to that advised the preceding season. The plants will now begin to grow apace, and will require two or three neat sticks each to support them; little further stopping will be needed, and the treatment in other respects as to shade, moisture, heat, and air, should be as during the first summer. If all goes well they will now grow freely, and by the end of July or beginning of August will have their shoots fully clothed with flowers. As soon as these show themselves cease syringing, or it will sometimes have the effect of causing the advancing bloom-buds to fall off.

During the time of flowering they may be placed on the front stage of the stove or intermediate house, where, associated with other blooming or fine-leaved plants, they will form a very distinct feature. When the flowering is over it will be well to move them to their original quarters on a shelf near the glass, treating them during autumn and winter as before; the ensuing spring they will bear pots 2 inches or 3 inches larger, but in this it is well to be guided by the quantity and condition of the roots, as they are impatient of too much pot-room. When the potting is carried

IMPATIENS SULTANI.

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out, as much of the old soil may be removed as can be got away without injuring the roots. During this summer the plants will attain a size that will enable them to produce flowers as abundantly as may be expected, however long they are grown; with treatment such as advised they will usually last for years, but being essentially what may be termed plants of small growth, they have a better appearance, and are more useful when cultivated in numbers of medium size than when grown larger. Consequently it is advisable to propagate a sufficient quantity of young ones each year to take the place of those that get less shapely and are not so well furnished. This Impatiens is an excellent subject for growing in small or medium-sized wire baskets suspended over the paths, and in no position is it seen to better advantage when in flower; but when so used, instead of being trained upright, the shoots should be tied in a horizontal position over the edge of the basket. For this purpose it is also better to use three or four of the young-struck cuttings together. It is likewise better to keep them in pots, plunging these in the baskets, filling up with sphagnum, in which a few pieces of Lycopodium are planted in the spring; the appearance of the baskets is thus much improved, and the general effect when the plants are in bloom heightened. Their treatment in other respects when in baskets requires to be in no way different from that which is advised for pot culture. When they flower sufficiently early in the summer months before the cool autumn weather sets in, they may be put for a few weeks in a conservatory, but not exposed during the time to currents of cold air.

There are several other species, some of which attain a larger size than I. Jerdoniæ, they strike easily and are grown on with little difficulty; cuttings put in early in spring, and moved on as they require more pot-room, make handsome blooming plants the same season, keeping on through most of the summer and autumn. For ordinary purposes it will be found better to propagate stock of these each spring.

I. flaccida. A dwarf bushy plant, that bears bright purple flowers. From Ceylon.

I. flaccida alba. A white-flowered form of the preceding.

I. repens. A dwarf species, with yellow flowers. Ceylon.

I. Sultani. A new species, with a dense bushy habit; it attains a considerable size, and is a profuse bloomer, keeping on through much of the autumn and winter, as well as the summer season; the flowers are rose-coloured. It comes from Africa.

INSECTS.—We have never seen these Impatiens attacked by any of the usual stove pests, except greenfly, for the destruction of which fumigate repeatedly, but not too severely.

INDIGOFERA.

The Indigoferas are a large genus of plants found in various parts of the world, the East Indies, West Indian Islands, Cape of Good Hope, New Holland, China, &c. Few of the species are worth a place, and even the most favourite greenhouse kind, I. decora, is now seldom seen. They thrive under treatment such as recommended for Cassia Corymbosa, which see.

The following two species are among the best:—

I. australis. An evergreen shrub that bears pink flowers. From New South Wales.

I. decora. An evergreen shrub from China, with pink flowers, produced in summer.

IPOMŒA.

One of the handsomest of Ipomœas is I. Horsfalliæ, a species of smaller growth than most of the genus; it is a twiner, and comes from the hot, moist regions of Africa or East India, consequently there is no use attempting its cultivation except where there is enough heat at command to keep it in a healthy state. When first it became generally known it was to be met with in most places where there was sufficient heat, but now it is rarely seen, and still seldomer in good condition, although it is by no means difficult to cultivate when once it gets established. It is not an easy subject to strike, being one of the plants that used to be held up by experts to young aspirants in the propagating department as a test of their abilities. Yet, with a knowledge of the right age and condition that the wood should have attained when made into cuttings, roots may be produced, but still much more time is required than with most other plants. A knowledge of the exact state the wood should be in when made into cuttings is difficult to convey in writing, and can only be acquired by practice and observation. So far as our own practice goes we have been able to succeed best when the cuttings were made from the preceding year's shoots immediately after flowering about the end of February; if these are inserted singly in small pots half filled with a mixture of peat and silver sand, the remainder all sand, kept moderately close and moist in a brisk bottom heat, they will generally callus over at the base in about two months, and form roots in a similar length of time, but the most certain means of propagation, and generally the best for private growers, who only require a limited number of plants, is to layer the shoots. Those operated upon should be of the preceding summer's growth, and of any convenient length, say 5 or 6 feet from the points; if these are slightly notched through at a joint in the way Carnation layers are prepared, and pegged down into 4-inch pots, drained and filled with a mixture of half fibrous peat and loam, the joint slightly covered with soil, and kept moderately moist, they will form roots enough to support the shoot and allow of its being severed from the parent plant in ten or twelve weeks. The layering may be performed any time after the growth has attained moderate solidity in the autumn until spring. Where a fair amount of heat can be kept up through the winter the layering may take place in autumn, which will give time for the young plants to get established on their own roots by spring, in which case a considerable saving of time will be effected, which will enable them to make a full season's growth. If layered so as to get well rooted in the spring, they will bear moving by the end of May into 6 or 7 inch pots, but it is not advisable to give too much root-room, as the plant is naturally much slower in growth than the generality of stove twiners or climbers, and it never attains anything near the size that most things do which luxuriate in strong heat; on this account it is much better adapted for stoves of limited extent than many plants that less deservedly are chosen. In no position will it better succeed, or interfere less with the other occupants of the house, than run on two or three wires lengthways over the path; here its beautiful, distinct, and handsome rosy red flowers are seen to the best advantage. As soon as the plants commence to grow they must each have a neat stick, round which the shoots will twine, and when they have begun to extend freely they should be stopped back, so as to secure their breaking enough shoots to occupy the room at disposal in the place they are to fill. So far as their requirements of heat, air, shade, and moisture go, they will succeed with that given to the generality of plants grown in a warm stove; 65° in the night, with a rise of 10° in the day, during the spring and summer, will answer for them, but they must not be kept too cool through the last months of the year, or in January and February, which is the usual time of their blooming—sooner or later, according to the heat maintained. Although the young plants will not flower much the first winter, it will be well to treat them in every way as if older. They will require little training after the shoots have once taken to twining round the wires, except that each should be kept to its individual wire, for if they get entangled it will be difficult afterwards to separate them. Shade just sufficient to prevent the leaves scorching during very bright weather, but discontinue it as early in the autumn as it can be dispensed with, and keep the atmosphere drier. The soil should never be kept so wet as in the case of freer rooting plants. By the end of March they will require moving into larger pots—about 12 inches in diameter. If very good fibrous loam is to be had, we should give it the preference, but where this is not at hand peat should be used. The shoots may be at this time shortened back about one-fourth, which will induce their breaking several eyes; two or three growths may now be allowed to each wire. Increase the temperature as the days lengthen, but be careful not to give very much water to the roots until they have got fairly into the new soil; again commence syringing overhead in the afternoons, and continue to do so until the beginning of September, when shading also may be dispensed with. If a temperature similar to that advised has been kept up, the flowers will begin to form towards the close of the year; they open in succession for several weeks. If required they may be taken off singly and mounted for bouquets, as from their very distinct character they harmonise well with most other things. When the blooming is over the plants can be kept somewhat drier at the roots for a few weeks; this will give them a rest, and afterwards the shoots may be shortened back, and as soon as they have pushed fresh growth they should be moved into pots about 3 inches larger than those they have already occupied, at the same time removing as much of the old soil from the upper portion of the ball as can be done without doing harm. Again water sparingly until the roots are fairly moving, as this Ipomœa always requires care in this respect, for if the soil gets at all saturated the roots are liable to perish, which would probably not cause the death of the plant, but would spoil the growth for a season, as it would take a considerable time to make fresh feeding fibres. Continue to treat as already advised, both during the summer, when the principal growth is being made, and also in the autumn and winter, when the flowers are developing. Each spring they should be repotted, a portion of the old soil being removed, but the root-room required is never so much as in the case of most stove subjects. A little liquid manure through the growing season will be found beneficial, but it must not be given so strong as to plants of more vigorous growth. They will last for many years if treated as advised, and not outgrow a limited space ; in fact, by cutting in freely each spring before growth commences, they may be kept within the limits they filled the first year of flowering.

I. Thomsoniana. This is a white kind, and appears to be almost, if not quite, identical with I. Horsfalliæ, except in the matter of colour, but the flowers are larger. It is a magnificent twiner, and will no doubt succeed under similar conditions to I. Horsfalliæ.

The following are stronger growers than I. Horsfalliæ, and we have found them best increased by layering, as advised for that kind.

I. alatipes. A stout-growing plant with heart-shaped leaves ; the flowers are salmon-coloured. Panama.

I. Gerrardii. A tuberous-rooted species that produces annual shoots and white flowers of large size. From Natal.

I. Learii. A strong-growing species, suitable for training round wires over a path in a long house where its free growth will have room to extend. The flowers are bluish purple. There are many others most of which succeed under treatment such as above recommended, but these will generally be found sufficient.

Insects.—Scale and mealy bug will both thrive on Ipomœas, but when grown in the position above indicated it is an easy matter to keep these pests down by the use of the syringe and sponging ; in the same way if thrips attack the leaves they can without difficulty be kept under.

ISOLEPIS.

This is a genus of ornamental grasses. I. gracilis is the best known, and almost the only kind used for pot culture. It comes from New Holland, and is one of the prettiest small green plants grown for greenhouse decoration.

Its cultivation is very simple, it thrives in any kind of moderately open soil. It is increased by division—a plant filling a 6-inch pot may be divided into pieces more or less at discretion ; this is best carried out in spring before growth begins. A portion of roots should be secured to each piece, and they should be placed separately in from 3 to 6 inch pots, according to the size of the pieces ; drain well, and add some sand to the loam or peat used. Give a good watering at once, and keep a little close in a temperature of 50° by night until they have made some growth, shading in the day when the weather is bright. Plenty of water at all times is necessary for this plant, but especially while growing freely. When well established the temperature of a greenhouse will be sufficient. More root-room should be given as required ; plants such as can be grown in 6-inch pots will be found large enough for most purposes.

Insects.—The only insect we have found troublesome on this Isolepis is aphides, for which fumigate or dip in tobacco-water.

IXORA.

If asked to point to a genus of plants inhabiting our stoves that combine the showiest of flowers with the finest evergreen foliage, we should have no hesitation in naming Ixoras ; and the freedom with which their great trusses of bloom are produced, ranging in colour from deep red through all the shades of scarlet and orange to white, entitle them to the first place in any collection of stove plants where there is sufficient heat to grow them. This is indispensable, for, coming, as they do, collectively, from the hottest parts of the world, they are essentially heat-requiring plants—in fact, they will bear as much as any plant in cultivation ; and, although they may exist in a temperature not sufficiently high, we should not recommend their cultivation where there is not the means of keeping them hot enough, not only in the summer but also in the winter, for to arrive at the highest point of success they should be kept growing slowly even in winter, as if growth is ever completely stopped through insufficient heat, they are almost certain to get into a stunted condition, from which it takes a considerable portion of the spring to get them out. Another advantage, when enough warmth is used, is that some or other of the kinds may be had in flower all the year round.

They strike freely from cuttings taken off at any time of the year when young half-ripened wood can be obtained. We prefer the strongest cuttings that can be got, as they make plants much quicker than weaker ones. Take them off at the latter end of February or beginning of March, and insert them singly in small pots two-thirds filled with sandy peat, the remaining portion being pure sand; they may be placed in bottom-heat if the temperature of the house is not kept sufficiently high at night, otherwise it is not necessary. Keep them moist and covered with a bell-glass, and they will strike in a few weeks; then gradually inure them to the air. As soon as the little pots are fairly furnished with roots, shift them into others 4 inches larger, using the best fibrous peat, with a moderate quantity of sand added, but no leaf-mould or manure, which for these and the majority of other plants of a similar character is a mistake, as both decompose too rapidly, getting into a pasty condition. Manurial elements can always be supplied in a liquid state during the period of active growth when the pots have got full of roots, at which time they are most wanted. As soon as growth has fairly commenced pinch out the points to induce them to break back, and keep them near the light with little or no shade. The atmosphere should be kept moist, with never so much external air admitted as will make it too dry, not even in the hottest parts of the day; for this reason, it is well to keep these, along with a few of the most heat-requiring subjects, at the warmest end of the house, giving the greater portion of the air needed at the opposite end. The temperature from the beginning of May throughout the summer months should run from 70° to 75° at night, with 5° more by day in dull weather, and 5° or 10° above this when it is sunny, will be rather an advantage than otherwise. For an hour or two after the house is shut up in the afternoons during bright weather the temperature may rise to 95°, or even a few degrees more will do no harm, providing the plants are grown in a good light house, and kept near the glass. After root-growth fairly commences they must always be well supplied with water; never at any time, even during winter, should they be allowed to get so dry as some plants need to be. Continue to treat as just directed, with a liberal use of the syringe until the end of August. The treatment now must be based upon the temperature that can be maintained through the winter, where sufficient heat can be kept up the plants may be at once moved into pots 6 inches larger than those they occupy, tying out the shoots so as to give enough room to the young growths that in healthy, vigorous plants are always being produced near the base. Syringe now more slightly, and, at the same time, a little more air, with a somewhat drier atmosphere, will be requisite for the general stock in the house; but the dry condition of the atmosphere that used to be at one time considered necessary through the autumn and winter for these and most other stove plants is simply wrong. As solar heat decreases reduce the temperature, but it should be kept up as near to 70° at night as possible, with a rise of 5° in the daytime. In this the plants will continue growing slowly through the winter, and with the increased warmth of spring will commence to push away freely. Any shoots that appear to be taking an undue lead may be stopped back. By the end of March plants that were not potted in the autumn should receive a shift, more or less in accordance with the abundance or scarcity of the roots. By the beginning of May the autumn-moved plants will also need larger pots, and the soil used should now be in a rough, lumpy state and as full of fibre as it can be had, with a fair mixture of sand.

Ixoras are naturally such free flowerers that they will bloom while small, in which state they are very useful for the decoration of the stove; if they have been kept, as suggested, sufficiently warm through the winter, they will be in flower during the latter part of May and the beginning of June. As a matter of course, the temperature will have been raised, as in the preceding year, and other details of cultivation, as then recommended, carried out. There is no necessity to cease syringing while the flower-heads are advancing or when the plants are in bloom, provided the operation is carried out early enough in the afternoon to allow the moisture to dry up before nightfall, otherwise it will sometimes cause the unexpanded flowers to drop off. After flowering, the shoots may be shortened back more or less as may seem to be necessary in order to preserve the symmetrical form of the plants, but if cut in considerably it will be late in the autumn before they flower again; whereas, if the decayed trusses of bloom are only just pinched out, shoots will be emitted from the sources from which these spring that will make a short growth and then flower, after which any strong growths that require it may be shortened back. Winter the plants as before, and in the spring give additional pot-room as needed. The treatment from this point will be of a routine character as hitherto recommended. When the plants have grown as large as is required, they need not be potted oftener than once in two years. In potting remove as much of the soil from the upper portion of the balls as can be got away without too much disturbance of the roots, returning them to the same pots or putting them into larger ones if requisite. A large-sized specimen will require a pot 18 inches or 20 inches in diameter. To facilitate their blooming early in spring, say by the beginning of May, whatever potting has to be done it will be better to carry out about the beginning or middle of September, which will give time for the roots to get established in the new soil before winter. About a month or so previous to potting any cutting in that may be required should be effected. They will bear a free use of the knife, even to the extent of reducing them to one-half their size. This has the effect of promoting the growth of strong shoots, which produce the finest heads of flowers, and which are much better than numbers of little blooms borne by plants allowed to get too large and full of weak growths. Managed as described, Ixoras will go on for almost an indefinite period. We have cultivated individual plants for twenty years, and have had them as strong and vigorous then as during the earlier portion of their existence.

I. alba. A white-flowered species from India, handsome and distinct, but not so free a grower as the others.

I. amboynensis. A very fine species introduced from Amboyna, a good grower and free bloomer, bearing a profusion of large orange-yellow heads. It is of a bushy, broad, spreading habit. Young specimens of this variety are preferable to old plants.

I. coccinea, from Eastern India, is a magnificent species, and one that when well managed bears freely very large heads of scarlet flowers. Its foliage and habit are also unexceptionable.

I. Duffii is a distinct species from the South Sea Islands. In habit it is not unlike I. Lobbii. The leaves, which are of ample size, are of a beautiful deep green. Some of them measure as much as 10 inches in length. In colour the flowers are deep red, with a slight shade of crimson as they get older; it forms immense trusses.

I. Griffithii. This is a large-leaved, erect-growing species from Singapore, with thick leathery leaves and yellowish-red flowers.

I. javanica. This is the freest grower of any which we have cultivated, and it is equally free in flowering, bearing a profusion of orange-yellow trusses that open almost simultaneously. It does not flower so freely for some time after being severely cut in as the other kinds. From Java.

I. princeps. A free-growing kind, with pale salmon-coloured flowers, which appear in large bunches. Java.

I. salicifolia. This comes from Borneo. Its flower-trusses are large, but somewhat thinner than those of the preceding, they are orange-scarlet in colour; the leaves, as its name implies, are of a long Willow-like shape. It generally succeeds better when grafted than on its own roots, the best stock we have found for it being I. Javanica.

The following, which we believe are all garden hybrids, are most beautiful, free-flowering kinds:—

I. amabilis. A strong, compact grower, with dark green leaves and very large flower-heads, dark orange in colour and produced freely.

I. Colei. This has dark green, somewhat ovate leaves, and produces large, dense heads of white flowers in profusion.

I. Dixiana. A vigorous-growing, free-flowering sort, the flowers are of a salmon-orange colour. One of the best for winter blooming. The plant will bear a lower temperature than most others.

I. Fraserii. A free, strong grower, with handsome, large foliage; the flowers, deep salmon coloured, are large and produced freely. One of the best of the hybrids.

I. Pilgrimii. A handsome orange-scarlet variety.

I. Prince of Orange. Another free-growing, orange-red sort.

I. profusa. Is of moderate growth, the flower-trusses large, pale salmon colour.

I. regina. Flowers very deep salmon colour. The plant is of a close, compact habit; a very effective variety.

I. Williamsii. This has fine, dark green foliage, is a good grower and free flowerer, producing a profusion of blossoms of a dark orange-red colour.

There are several other species and varieties in cultivation, but the above are the best and sufficient for all ordinary purposes.

INSECTS.—Ixoras are very liable to the attacks of brown scale and mealy bug, which, if not either completely eradicated or kept well in check, entail a great deal of labour from the rapidity with which they increase in consequence of the strong heat which the plants require, and of a natural partiality of the insects for them. To do full justice to the plants, and to preserve their flowers in full beauty, they must be kept completely free from bug, as when it gets up into the young flower-heads its removal can never be effected without injury to the bloom. Repeated and thorough washings, dippings, or syringings in strong insecticide through September and October, when the plants are making less growth, if persisted in, will free them from this pest, and also destroy scale. If the latter reappears, washing and sponging at intervals through the season will keep it down. The humid atmosphere and continuous syringing through the season of growth will be sufficient to keep down red spider, and will also check greenfly and thrips, but should these make their appearance, fumigation must be resorted to.

JASMINUM.

(Stove.)

Among stove Jasmines may be found some of the most highly fragrant plants in cultivation, the perfume known as oil of Jasmine being procured from two or three of the species, such as J. grandiflorum, J. Sambac, and J. officinale. Among stove species all are favourites, but some are much superior to others, and to these it will be better to confine the following cultural details, which will answer for the shrubby and also the climbing kinds, with this difference, that the largest growers obviously want more root-room than the less vigorous sorts. Some of them furnish suitable shoots to make cuttings of more freely than others, and the propagator should select such as are in proper condition for the purpose, neither too soft nor too hard.

The best season to propagate is spring, when shoots a few inches long can be had, as then there is plenty of time to get the young plants established before winter. Take them off with a heel, and insert them thickly in small pots in sand, covered with a bell-glass; kept moist and shaded in a temperature of 70°, they will root in the course of a month; then, when a little hardened by exposure to the full air of the house or pit in which they have been struck, they should be moved into 3-inch pots in good fibrous loam, to which add a little finely-sifted rotten manure and some sand, giving as much water to the roots as is requisite to keep the soil moderately moist, but not over wet, as most of the species to which these remarks refer are somewhat spare-rooting plants. Keep them warm and in a fairly moist atmosphere, with a full complement of light, some air, and a little shade when the sun is bright. Syringe each afternoon to keep down red spider, by which they are liable to be attacked. During the middle of summer a night temperature of 65° or 66° will answer, and one 10° higher by day. Distinction will now have to be made between the climbing and the shrubby kinds. The latter will need to have the points of their shoots pinched out to lay the foundation for bushy specimens; the former should be encouraged to keep to their erect habit, and simply be stopped when some growth has been made, so as to encourage as many shoots as required to furnish the pillar or rafter to which they are ultimately to be trained, in which way the climbing kinds can be grown with the best results. When the pots are moderately filled with roots, move the plants into others 3 inches larger, using the soil a little more lumpy, and continue the treatment advised as to air, water, and heat until the autumn approaches; then give more air, keep drier at the roots, and lower the temperature, which, during the last months of the year and up to the latter part of February, may be about 60° in the night. After this gradually give more warmth, and as soon as the roots are in motion move the plants into pots 3 inches or 4 inches larger, continuing the treatment advised for last year in every way. By midsummer it should be determined how the climbing sorts are to be grown; the weaker growers, such as J. Sambac, are as well with their roots kept in pots, increasing the size as more room is required; the bushy kinds need to be similarly treated in this matter, and care should be taken not to over-pot them, as they will succeed better with less root-space than many plants. If this treatment is continued they will last for years; each spring as much of the surface soil as can be got away without materially interfering with the roots should be removed and replaced with new. Clear manure-water, given at short intervals through the growing season, will help the growth, which it is necessary to encourage, as the flower forthcoming with these plants is generally proportionate to the wood they make. We have found the time of blooming with the stove species of Jasmine very much consequent on the amount of heat they are subjected to.

The undermentioned we consider the best, taking all properties into consideration:—

J. Duchesse d'Orleans. A climbing or tall-growing kind that has originated on the Continent, with very handsome white flowers, which keep on opening in succession, so long as any growth is being made. It likes a brisk heat.

J. gracile. A plant of slender habit, from Norfolk Island; it has white flowers, and will grow in a lower temperature than the others named.

J. gracile variegatum. A form of J. gracile, from which it differs in being variegated.

J. gracillimum. A new and beautiful species with white, sweet-scented flowers, produced freely from every bit of growth the plant makes. One of the best hard-wooded flowering stove plants introduced in recent years. Northern Borneo.

J. ligustrifolium. An evergreen shrub with white flowers, produced for a long period in succession. From India.

J. Sambac fl.-pl. This is an evergreen climbing species that bears white, highly fragrant double flowers most useful for bouquets. It is not a strong grower, and must not be over-potted. A native of the East Indies.

INSECTS. — These heat-requiring Jasmines are subject to most of the insects that affect plants requiring artificial warmth, including aphides, thrips, and red spider, which must be kept down by daily syringing overhead and fumigating. If mealy bug or scale attack them, syringe well with or dip in insecticide, until they are free from the pests.

JASMINUM.

(Greenhouse.)

The greenhouse kinds of this genus are evergreen, proverbial for the pretty flowers they bear.

The propagation and cultivation of the kinds under notice is similar to that advised for the stove species, which see, except that an ordinary greenhouse temperature is sufficient after the plants get established.

The undernamed are the most suitable for use as greenhouse climbers :—

J. azoricum. Has white flowers, produced in summer. From Madeira.

J. grandiflorum. A white-flowered summer bloomer. From India.

J. heterophyllum. A white-flowered species that blooms in summer. From Nepal.

J. odoratissimum. Flowers white, blooms in summer. A native of Madeira.

JONESIA.

Of the known species of this genus J. Asoca is much the most important; it is an evergreen stove tree requiring a high temperature to grow well. It has large leaves, compared with which the flowers are small ; they are produced in corymbs, and are individually about the size and shape of those of the common Hawthorn, to which the trusses are similar in size ; the colour is dark orange. It is suitable only for a large house.

It will succeed under treatment similar to that advised for Amherstia (which see), except that it will do with somewhat less heat. Its flowers are fragrant. Introduced from India.

JUBÆA SPECTABILIS.

(Syn.: Cocos chilensis.)

This Palm is well worth growing, as it is one of the not too plentiful kinds that will thrive in a greenhouse. It is a handsome species attaining a large size as it gets old, and is pretty in a young state. From Chili.

Propagation and cultivation given under Palms, general details of culture.

JUSTICIA.

This genus contains a large number of species of easily-managed quick-growing plants, that soon arrive at a flowering state. Most of them are evergreen stove shrubs ; —the most desirable kinds are remarkable for their free disposition of flowering.

They strike readily from shoot-cuttings in spring, kept moist, close, and shaded in a moderately brisk heat; when rooted move them singly to 3-inch pots, giving them good turfy loam with some leaf-mould, rotten-manure, and sand, in which mixture they thrive freely; keep them rather close until they have begun to grow away, when pinch out the tops and give more air, still keeping them in a stove temperature with a tolerably moist atmosphere, and shade when the weather is bright. In two months after they were potted they will require moving to 6 or 8 inch pots, according to the more or less natural strength of the kinds grown ; use the same sort of soil, but let it be now in a more lumpy condition. Again pinch out the points, syringe daily, and give liberal waterings as the soil gets full of roots ; stand them with their heads well up to the glass, and give air and shade ; as the summer draws to a close, dispense with the latter altogether as soon as the plants will bear it, give more air and put a few sticks for support. The most useful kinds are those that bloom in autumn. After flowering those that are to be kept for another year should have their shoots shortened and be kept in a temperature through the winter of about 60° by night. In spring shake a portion of the old soil away and give pots 3 or 4 inches larger, striking cuttings of these kinds that it is preferred to bloom in a smaller state, and treating the old plants as advised in the summer previous. When the pots are full of roots manure-water is a great assistance, either with small or large examples.

J. carnea. A strong-growing free-flowering species, that bears large heads of flesh-coloured flowers. An autumn bloomer from Rio de Janeiro.

J. coccinea. A winter or early spring flowering kind with scarlet flowers. From South America.

J. lilacina. A pretty species which flowers at various times.

J. splendens. A desirable free-flowering kind, that may be had in bloom at different times according to the warmth it is subjected to.

INSECTS.—Aphides and red spider sometimes affect these plants, but are not so partial to them as to many things; syringe freely with clean water to remove the latter; fumigate for the aphides.

KALOSANTHES.

These are evergreen greenhouse plants from the Cape of Good Hope, that bear freely their showy flowers which are produced through the summer months. The plants are of compact branching habit and carry their flowers in large trusses on the extremities of the shoots. They are among the easiest to propagate of cultivated plants, as any bit of shoot if only laid on a damp surface in a suitable temperature will emit roots. They may be struck at any time during the spring or summer, but the spring is preferable as it gives time for the young plants to get their growth well hardened up before winter. About March select shoots of medium strength some 4 inches long, remove the leaves from the lower half and put five or six together in 6-inch pots filled with sand; give a little water, but do not keep too wet or there will be danger of their rotting. Stand in a temperature of about 55°, but do not confine the cuttings under a propagating glass or frame as there is no necessity for keeping them from the air, their succulent nature being such that they will not flag so as to be harmed by full exposure to the air of the house or pit in which they are put to strike. They will root in a few weeks, after which move them singly into 3-inch pots, using good turfy loam broken fine, with some sand and a little sifted rotten manure added. As soon as they begin to grow cut out the points, which will cause them to break several shoots; stand them near the glass in a house or pit where they can receive ordinary greenhouse treatment in the matters of air and water, but do not shade as they require all the sun they can get. By the beginning of June they will need moving into 6-inch pots, in the same soil as before; after this keep them indoors for five or six weeks, when stand them out in the full sun in the open air; give water regularly as it is needed. Remove them to a pit or frame before there is danger of frost, standing as near the glass as convenient. Winter at about 40° in the night; towards April again cut out the points of the shoots and give them a 4-inch shift. Kalosanthes are free rooters, and will bear liberal pot-room. Use the soil a little more lumpy, and drain the pots well. A shelf or stage in a greenhouse or pit where they can be close to the glass is now necessary to keep the growth short and sturdy, as if drawn they will be spoilt—to prevent this give plenty of air in the day. At midsummer turn them out-of-doors in a sunny position, standing the pots on a body of ashes, and giving water freely as the soil gets filled with roots. Nothing more is now required except to house them again early in September, wintering as before well up to the glass and applying no more water than will keep the soil in a slightly moist condition; this, combined with the exposure out-of-doors in the sun, is necessary to induce the strongest-growing varieties to flower fully. Keep a temperature similar to that advised for the previous winter; if the foregoing directions are followed all the leading shoots will in spring set flower which will open in June; each shoot should have a small stick for support. The flowers will last three weeks or more, during which time they will be very effective in the greenhouse or conservatory. After blooming cut the shoots well back, and as soon as they have broken into growth move out-of-doors, where allow them to remain until the time for housing comes round. We do not advise that plants that have flowered as described should be potted the same season, but after wintering as before give pots 4 or 5 inches larger in April, and again stand them out in June; they will not bloom this summer, but by treating generally as in the year previous to their flowering (except that it will be better not to stop the shoots) they will make large specimens the ensuing season producing a sheet of flowers. Afterwards in most cases it will be best to discard them and to depend on young stock to take their place. If large specimens for exhibition are required in the least time possible the plants must not be allowed to flower the summer they are in 10-inch pots, but must again have their shoots cut back in spring and be moved on into large pots as soon as they have again broken, tying the shoots well out so as to give them plenty of room. They may be flowered the second summer after the cuttings are struck, in the shape of small plants in

6-inch pots with a single head of bloom, but, to admit of this they should not be stopped the first year, but grown on with a single shoot from the cutting pot; in this way they are useful for decorative use.

The following are good varieties:—

K. biconvexa. A white-flowered, small-growing sort.

K. coccinea. A good red-coloured kind, and a free grower.

K. Frederick Desbois. A good grower, that produces very large trusses of deep red flowers.

K. jasminea. A small-growing white-flowered kind, not requiring nearly so much pot-room as the others.

K. Madame Celeste Winans. A remarkably free-blooming and free-growing variety, bearing whitish pink flowers.

K. miniata. A free-growing and very free-flowering sort, the head smaller than most of the other kinds; deep pink approaching to pale red.

K. Phœnix. A stout free-growing sort, with immense heads of fiery red flowers. A fine variety.

INSECTS.—Kalosanthes are seldom molested by insects except aphides, which if troublesome must be destroyed with tobacco smoke.

KENNEDYA.

This is a handsome genus of evergreen greenhouse, summer-blooming twiners, natives of New Holland and New South Wales. For a lofty house the strong-growing species are well adapted, especially for draping the roof, from which their long drooping shoots, hanging in graceful festoons, are very effective. One advantage which they possess for growing in such positions is, that they will bear cutting-in freely, which is an advantage in the winter, when as much light as possible is required by the plants grown underneath. This is a consideration not sufficiently kept in sight in the selection of the kind of plants to be grown for roof-climbers, between which and the things that occupy the body of the house there must necessarily always be a compromise, as there is no question but that the climbers do more or less injury to the other plants, and are simply allowed to occupy their position to give a general effect to the house. There is a great difference in the strength of growth and general appearance of the different species, the smaller growers being more suitable for clothing a pillar than training to the roof. The strongest growers can with advantage be used for covering a back wall, in which situation they will succeed, even in partial light, much better than many things of more tender nature; they are easily grown, make rapid progress, and are not liable to get out of order at the roots to such an extent as many plants are, but, like some other subjects of similar nature, they do best when planted out. They are much better for being kept in a pot for a time until they have acquired sufficient strength of root to enable them to lay hold of the soil in a reasonable time after they are turned out.

Kennedyas strike from cuttings of the young shoots taken off with a heel in spring, when about 3 or 4 inches long, put singly in little pots in sand, and kept in an intermediate temperature, close, moist, and shaded; when well rooted move them from the propagating frame, but encourage growth by a genial temperature, a little shade, and a moderately moist atmosphere. By midsummer they should be moved into 6-inch pots, and growth assisted afterwards by a continuance of the treatment hitherto advised. Each plant will require a stick to support the single shoot which it will have. Towards autumn give more air, dispense with shading, and lower the temperature down to about 40°. In March or April the plants should have a 2 or 3 inch shift, according to the quantity and condition of their roots. Kennedyas will thrive in either peat or loam; it is better to use the former for the weaker-growing species, as it will impart a freer disposition of growth, and to confine the strong growers to loam, which should be good in quality, containing plenty of vegetable matter. They are comparatively strong rooters, and do not require the soil broken very fine; add to it a fifth or sixth of sand, according to its nature; drain the pots sufficiently, as from the vigorous character of the plants they will need a good deal of water in the growing season. After potting place them for a few weeks, until the roots get hold of the soil, in an atmosphere a little closer than that of an ordinary greenhouse, keep the atmosphere rather moist during this time, and afterwards give more air in the early and middle part of the day, close the house in good time, and syringe overhead. Give water to the roots as required, and when in active growth they will take a good deal. Continue this until the middle of August, when the plants should have more air, and syringing should be stopped to discourage further growth and ripen up the wood.

At the time of potting, half-a-dozen sticks, 3 or 4 feet long, should be inserted in the soil just within the rims of the pots; round these the shoots ought to be kept closely and regularly trained, as if allowed to twine to the supports, or become entangled with each other they are difficult afterwards to regulate without injury. They should be kept through the autumn and winter in a temperature of from 35° to 40° in the night, and 10° or so warmer in the day, but not so high as to excite any growth, or they will suffer when the roots are disturbed in planting out, which should be before growth begins early in the spring; the border in which they are to be planted may be from 1 to 2 feet in width, according to the space to be covered. It should have 4 inches of drainage in the bottom, consisting of crocks, broken bricks, pebbles, or anything of a similar nature, on which place an inch or two of fibrous material, over this put 10 or 12 inches of the soil, which should have a good quantity of sand mixed with it, and a sprinkling of crocks or charcoal will be an additional assistance in keeping it sweet. In planting disentangle the roots so far as can be done without injuring them, spread them out and make the soil tolerably firm. Do not give water until it is required, which, if the soil at the time of planting is in right condition as to moisture, will not be nearly so soon as in a pot. Train the shoots in their places. Nothing has been said about stopping—the necessity or otherwise for this will depend upon the number of shoots the plants have and the requirements of the situation. A single shoot to each wire will, in most cases, be preferable to more. They will require little further attention except water at the roots as needed, keeping the shoots from getting entangled, and a sufficient use of the syringe during the growing season to keep down aphides and red spider. When they have filled their allotted space the shoots must be reduced from time to time during summer and in the autumn, cutting in as far as requisite. When the soil gets at all exhausted, an inch or two each spring may be removed and replaced with fresh, and manure-water during the growing season will also be a great assistance to them.

The undermentioned kinds are deserving of a place:—

K. Fredwoodii. An Australian plant, a good grower, and free bloomer. Flowers red.

K. inophylla. This is a fine scarlet kind. A New Holland species.

K. Makoyana. A Swan River plant, with scarlet flowers. A free grower.

K. Marryattæ. A handsome scarlet-flowered species from Australia.

K. monophylla. A strong-growing sort from New South Wales with purple flowers freely produced.

K. nigricans. Flowers purple and green. It is from New Holland.

K. ovata purpurea. Is from New Holland. It has purple flowers.

K. rubicunda. A strong-growing kind from New South Wales. Flowers deep red.

INSECTS.—If they ever get affected with scale, the best method of dealing with them is to partially head them down in the winter, when at rest, cutting into the strong wood, untwining this from the wires, and steeping the whole down as near as can be got to the collar in insecticide; repeat the operation two or three times in the course of a few weeks, before they have begun to break, and brush it well in about the collar of the plants. After cutting back thus severely they must not be over-watered at the roots, and much less must be given until they have made progress.

KENTIA.

This beautiful genus of Palms was at one time included in Areca, but has been separated from it. Several of the kinds stand at the head of the list of cultivated Palms, not alone for their beautiful form, but also because they succeed well with no more warmth than an ordinary greenhouse affords.

For propagation and cultivation, see Palms, general details of culture.

K. australis. A handsome species, with thin, yet well-proportioned stem; the leaves are pinnate, and attain a moderate length as the plant acquires age. From Lord Howe's Island.

K. Belmoreana. A grand species, with a markedly distinct habit. The stem is of medium strength, the leaves are pinnate, the long pinnæ prettily curved, in addition to which the upper portion of the leaves is so beautifully arched as to give a vase-like appearance to the plant. It comes from Lord Howe's Island.

K. Canterburyana. A strong-growing kind, with long pinnate leaves. Lord Howe's Island.

K. Fosteriana. A large, strong-growing, handsome species, with long pinnate leaves that spread horizontally. From Lord Howe's Island.

K. Wendlandiana.—A very handsome species recently introduced; the leaves are pinnate, the segments somewhat unequal in length. It attains a large size. From Queensland.

LACHENALIA.

These are bulbous plants of small growth, natives of the Cape of Good Hope, and well adapted for pot culture. Some bear forcing well, or may be allowed to come on into flower without heat; treat like the ordinary occupants of the greenhouse.

They can be increased either by seeds or offsets; the latter method will in most cases be best. All that is necessary is before they start into growth to separate the offsets, which are produced freely, and put them six or eight together in 6 or 7 inch pots in free loam, to which a moderate amount of sand has been added. Stand, where worms will not have access to the pots, plunged in ashes, within a frame, the lights of which can be taken off in mild weather, putting them on when there is danger of frost, and covering well up so as to prevent the soil being frozen; or, if there is room, they may have a place in the greenhouse. In all cases see that they get enough water during the season of growth; when they show signs of going to rest, by the leaves beginning to die off, give no more than will just keep the soil from getting dust dry. When they begin to move again water freely; if the offsets were strong when taken off, some of them will flower the following year, during which treat as before, giving larger pots if such appear necessary.

When to be forced secure the strongest bulbs—keeping the weaker ones by themselves—and attend to them as advised for the young stock until they have made plenty of roots and some top growth; they may then be put in a temperature of 50° or a little more, which will soon bring them into flower. When the flowers are open move the plants to a cooler place, such as a greenhouse or conservatory, where they will last for some time in good condition. After the blooming is over continue to supply them with water until the leaves again die down, after which keep dry as before. So treated, they will go on for an indefinite time, yearly increasing by the offsets they make.

The following are pretty kinds:—

L. fragrans. Flowers red and white.

L. pendula. A tall-growing sort, with red, yellow, and green flowers.

L. quadricolor. Orange, red, and yellow.

L. Nelsonii. Yellow.

L. tigrina. White.

L. tricolor. Yellow, red, and green.

L. quadricolor and L. tricolor are both good forcers; the others do better let to come on without forcing, giving them greenhouse treatment through the winter.

INSECTS.—These plants are not much troubled with insects except greenfly, for which fumigate.

LAGERSTRŒMIA.

In these we have a small genus of plants, the most suitable for greenhouse cultivation of which is the East Indian L. indica. This species is often spoilt by being kept too warm, in which case it grows too weak and straggling to bloom freely. A well flowered example of this Lagerstrœmia is a beautiful object; quite different in appearance from any other plant with which we are acquainted.

It is increased by cuttings made of the young shoots, taken off early in spring and put several together in 5 or 6 inch pots in sand; stood in a temperature of 65°, kept moist and moderately close, they will root in the course of a month, after which remove the glasses and put singly in 3-inch pots. Good turfy peat answers for it, with some sand added; keep the little plants close for a week until the roots begin to move, after which stand in a light position, shading from the sun, and giving air in the daytime. Now keep the temperature about 60° in the night, and syringe freely when the house is closed in the afternoons; as soon as growth has fairly begun pinch out the points of the leading shoots. They will soon require more room, and will bear a liberal shift—7 or 8 inch pots will not be too large; some rotten manure should now be put in the soil, and the potting should be moderately firm. Put a stick to each leading shoot; when the plants have begun to move in the new soil they will do through the remainder of the summer, in a greenhouse temperature; continue to shade when necessary, and syringe daily when the weather is sunny, giving plenty of water to the soil. In autumn keep drier and leave off shading and syringing. Keep through the winter in a temperature of about 45° by night, with the soil somewhat dry. Early in March cut the shoots well in, after which the atmosphere should be kept a little close, and they should be syringed overhead daily; the night temperature may now be raised three or four degrees. When the plants have broken into growth move them into pots 3 or 4 inches larger, using soil similar to that which they have hitherto had, removing a little of the old material, but not so as to disturb the roots much. Keep a little closer for a week or so, after which admit more air, and again give a little shade in bright weather. If all goes well they will now grow fast, and require a stick to support the leading shoots. By the middle of June they will begin to show flower, and will be benefited by some weak manure-water once or twice a week; about the end of July the flowers will commence to open, after which keep cool and shaded from the sun. When the blooming is over give plenty of air, and less water to the roots, and allow them to go to rest in the autumn. Winter as before, and in the spring again repeat the cutting back, and repotting, treating afterwards as recommended for the preceding season. So managed the plants will last for several years. There are two forms of this Lagerstrœmia, one bearing flesh-coloured flowers, the other rose-coloured; both are well worth growing.

INSECTS.—Red spider will live on these plants, but the use of the syringe advised will usually be found sufficient to keep this insect down. For aphides fumigate.

LALAGE.

These are pretty Leguminous plants, natives of New Holland, but not now much grown. They require similar treatment to the Hoveas, which see.

There are only two or three species in cultivation.

L. ornata. Has yellow flowers, and blooms in spring.

L. tenuifolia. Also a spring bloomer.

LAMBERTIA.

These are evergreen greenhouse shrubs, of moderate size, from New Holland. The flowers are pretty, but not very effective. They succeed with treatment such as required by Boronias, which see.

The two following kinds are the best representatives of the genus :—

L. formosa. Flowers red, produced in summer.

L. uniflora. White. Also a summer bloomer.

LANTANA.

These are quick growing evergreen greenhouse shrubs, bearing pretty globular heads of flowers, produced freely over a long period in summer and autumn. They are easily grown, and at one time were much more generally in fashion than at present. The present race of varieties have been raised from seeds of the original kinds, indigenous to South America and adjacent parts.

They strike easily from cuttings made of the young soft shoots, taken off early in spring and put an inch apart in 5 or 6 inch pots in sand; kept close, moist, and shaded in a temperature of 60° they will root in a fortnight, after which expose them to the air of the house, and move singly into 3-inch pots in turfy loam, to which add some leaf-mould and sand. Keep in a similar temperature during the night to that in which they were struck, letting it rise by day, with some air given and a little shade when the sun is bright. Pinch out the points of the shoots as soon as top growth has fairly commenced; Lantanas are very quick growers and will again require stopping, and in a few weeks moving into 8 or 9 inch pots ; give them rich soil of a similar description to that used at the first potting. Now syringe freely overhead every evening, and again stop the points of the shoots ; give more air as the season advances, and put a stick to support the principal shoot of each plant. They will flower through the summer and autumn, during which time they will be benefited by the application of manure-water two or three times a week. Growing so quickly as Lantanas do they need a good deal of moisture to the roots, and must not be allowed to go short, or their blooming will be interfered with.

In the autumn keep the soil drier, and winter out of the reach of frost. In the spring, if large plants are required, they may be freely cut back and moved into larger pots, partially removing the old soil and replacing it with new; or if smaller examples are deemed preferable discard the old plants, only keeping enough to furnish cuttings.

The following are a good selection of sorts :—

L. Don Calmet. Yellow and pink.

L. Distinction. Orange scarlet.

L. Herione. Crimson and dark brown.

L. Favourita. Yellow and reddish brown.

L. Innocence. Sulphur and white.

L. La Neige. White.

L. Le Styx. Red, shaded with crimson.

L. Magenta King. Reddish purple.

L. Mons. Roucier Chauviere. Yellow and red.

L. Rayon de Soliel. Yellow and violet.

INSECTS.—The regular use of the syringe is usually sufficient to keep down red spider. For aphides fumigate.

LAPAGERIA.

Few plants, certainly no greenhouse climbers, possess so many desirable properties as do the white and red forms of Lapageria. When the red variety was first seen, flowered in a manner that only gave an imperfect idea of what it has since proved to be, all who saw it pronounced it one of the very finest plants ever introduced; but as its requirements became better understood, and it acquired strength and size, its full beauty and freedom of blooming became fully realised, for, in addition to the individually attractive character of the flowers, and their elegant drooping habit, it exhibited the excellent property of flowering over a much longer period than most plants. Indeed a large well-managed specimen when planted out, so as to have plenty of room for its roots, will continue producing its brilliant campanulate blooms for several months in succession. In general habit the plant has one advantage over most climbers, that it covers a very considerable space, yet is not such an over-rampant grower as to be at all difficult to keep within bounds. Its natural disposition of producing strong underground shoots, which yearly break up from the collar below the surface of the soil, keeps the base continuously furnished with young growth in a way that prevents its getting naked at the bottom; another advantage which the plant possesses is, that its stout, glossy, ovate-lanceolate leaves are sufficiently large to be effective, but neither too big or numerous to shade injuriously the generality of things grown in conservatories, which often are seriously injured when the roof-climbers are of an over-vigorous character.

We have so far only spoken of the plant when grown as a climber, in which position its flowers are best seen, but it is also well adapted for being treated as a trained pot specimen. In this way the red variety has been produced bearing 500 of its deep red, white spotted, or marbled flowers at a time, in which condition few plants could be more effective. The red variety, however, is eclipsed by the newer white form, a counterpart of the former in all except that its flowers are pure white. Inasmuch as white flowers of such a character as this are scarce, the white Lapageria is a real acquisition, especially for cutting. When arranged in the natural drooping position, for filling vases or epergnes, both varieties are effective; they are also well adapted for bouquets where their long-enduring capabilities—they will last for a week almost as fresh as when growing on the plant—have few equals.

When the red or typical form was first introduced it was considered difficult to grow, for the simple reason that has given many other fine plants a bad character in this respect, namely, the fact that they cannot conform to treatment suited to subjects that exist naturally under widely different climatic conditions. It is found in Chiloe, where it is represented as twining over the undergrowth of shrubs in the woods, where consequently it receives considerable shade. The country is subject to frosts and deluging rains in winter, and is also wet and cold in the summer, the temperature seldom rising above 70°, and generally being considerably lower. This at once points to the plant's requirements under cultivation, showing the necessity for supplying it liberally with moisture both overhead and at the roots, as also its inability to bear anything approaching a hot or dry atmosphere, and its need of shade in bright weather. All this has been fully verified in practice, as where these conditions do not exist it does not succeed well. All the plant requires in the shape of heat is just enough to exclude frost; on the shady end or side of a cold conservatory or corridor it is at home, where it can have plenty of root-room, requiring in this respect more space than many things would bear without being induced to grow too rampant.

The red and white varieties require the same cultural treatment, and, when grown as trained pot specimens, must, as they get big enough to need it, have large pots. They will succeed in either peat or loam, or a mixture of both; but where good peat containing plenty of vegetable fibre can be had it should be used. They are strong-rooted plants, and do not require the soil to be broken very fine, but, as the character of the roots is such that they do not like shaking out so as to renew the material, it is necessary that whatever is used should be of a description to last long before it becomes adhesive, consequently plenty of sand must be added—one sixth or seventh, according to the character of the soil, will not be too much; from the quantity of water required it is necessary that the drainage should be ample and sufficiently secured from the soil getting washed down into it by a layer of sphagnum or turfy fibre. As will be easily understood from the comparatively low summer temperature of the native country, they are here early excited into growth, which necessitates their being potted correspondingly soon in the season, for they do not like any interference with the roots when growth is in progress. They are not, however, plants that will show the effects of such treatment as some things would, but when subjected to this usage they do not increase in strength so fast as if managed more in accordance with their requirements.

In selecting plants for growing on see that they are free from scale insects, as both the white and brown species will live on them; if but a trace of the former can be found the best course is to put the plants in the fire, as the trouble in completely eradicating the pest is greater than they are worth, and the brown species is a source of continual annoyance.

When these plants were scarcer than at present, and there was usually a reluctance to sacrifice the shoots for layering, propagation from cuttings was often resorted to, but this is a slower method, and layering is now in most cases adopted. The course to pursue is where stout plants are at hand to layer all or such portion of the shoots as required in autumn; all that is needed is to put an inch or two of moderately fine peat mixed with sand on the surface of the bed in which the plant is grown, or, if in a pot or tub, to fill a large box or pot with the peat and sand, standing it near the plant so as to admit of the shoots to be operated on being bent and pegged down their whole length so that the stem is covered about an inch with the peat, thus covering the stalks of the leaves and about one-third of the leaf-blade. The shoots can be coiled round on the surface of the box or pot so as to occupy the whole; keep the soil moderately moist, in this way the buds at the base of the leaves will emit roots and make shoots which will appear during the ensuing spring. Each of these must be supported with a stick round which it will twine. During the summer syringe slightly overhead; about midsummer they should be taken off with their roots intact, and put singly in 5 or 6 inch pots filled with soil of a similar description to that in which the shoots were layered. Water must be given as required, and the young plants encouraged to get established before winter, during which keep at an ordinary greenhouse temperature. The weaker plants had better be grown on another season in the pots they occupy; the strongest should be moved about March, loosen the roots a little, if these are plentiful give a 3-inch shift, making the new soil quite firm. It is not yet advisable to put them on a permanent trellis, but they should have five or six good sticks a yard in length inserted in the new soil just inside the rims of the pots, and round these the shoots should be trained. These, as growth extends, should be regularly attended to all through the summer, as, if the tender points are allowed to become entangled they cannot afterwards be separated without injury. At all times they require plenty of air, but do not like cold draughts. After potting the plants should be placed in a house or pit where an ordinary greenhouse temperature is kept up. If subjected to more heat than this the growth produced is generally so soft that the young leaves are liable to injury by very little exposure to the sun. After potting do not give water for a few days, but the soil must at no time be allowed to get as dry as would be necessary with most things. As the weather gets warmer give air, and when they have commenced to grow freely a slight damping overhead with the syringe in the afternoons will be beneficial. The habit of the plants is such, naturally breaking up from the bottom, that no stopping is required. All that is necessary through the spring and summer will be to attend to training the shoots, giving plenty of water to the soil as the roots begin growing well, to admit air freely in accordance with the state of the weather, and to shade slightly when the sun is powerful. In the autumn discontinue shading and the use of the syringe, giving abundance of air to discourage further growth. Through the winter a night temperature of 35° or 40°, according to the state of the weather, will be sufficient, reduce the amount of water to the roots, but never allow the soil to become dry. About the same time in the spring again repot, letting the size of the shift be proportionate to the progress the plants have made. If roots are plentiful, pots 3 or 4 inches larger will be required; use the best fibrous peat that can be got, and at the same time loosen all the shoots from the sticks, and replace these with others taller, so as to accommodate the increased growth. Treat through the summer as in the previous season, and again in the autumn and winter keep them cool.

By the time of the next shift in spring the plants, if growth has gone on as may be expected, will be large enough to be placed on a wire trellis, not too big, although the rate of yearly increase in size will now be considerable, as the shoots thrown up from the base will be very much stronger than those which were produced at first; disperse them over the trellis, so as to furnish it evenly, and wind the strong young shoots that rise from the bottom regularly round it. The growth should not be kept trained down, but ought to be run up strings tied to the top of the trellis, and thence in an upright direction to the roof. Up these the shoots should be kept trained, where they will complete their growth and set flowers, after which they can easily be wound round the trellis, where they will expand through the advanced summer and autumn. All now required is to continue the same treatment winter and summer as previously advised, giving more root-room as necessary until they occupy pots or tubs 20 or 22 inches in diameter, in which they may be kept in health by the assistance of manure-water during the growing season for several years, when, if desired, they can be planted out in a greenhouse or conservatory border. They are not things that require much use of the knife, but, as the weaker old shoots cease to grow much after the plants get to producing strong sucker growths, the former may be gradually cut out.

When intended to be grown as climbers or for covering a back wall one mistake is often committed, and to it are to be attributed frequent failures—that is, turning them out while very small into a large body of soil in a border. Lapagerias are by no means such quick growers as most things of a climbing habit, and the considerable body of soil in the prepared border gets sour and unhealthy before the roots lay hold of it; the consequence is that the plants refuse to grow at all, and remain for years in a state admitting of little progress. If ordinary sized plants are procured it is much better to grow them on in pots for a year or two until they get enough roots to penetrate the soil freely the first summer they are turned out, in which case they rarely fail to do well, provided they are properly treated in other respects. Planting out should be done early in the spring, before growth commences, or the disturbance of the roots, inseparable from the necessary spreading out, will stop growth in a way that would much retard it for the season. The drainage of the border must be ample, and the soil fibrous peat, with enough sand added to it; and as the plants increase in strength it is as necessary to regularly keep the shoots trained as it is when grown in a pot. As the soil becomes exhausted before growth has commenced, each spring an inch or two may be removed from the surface and replaced with new. Manure-water through the summer will also be an assistance. So treated the plants can be kept growing in a vigorous condition for a number of years. We would advise all who have the red variety to procure the white one; they are fit companions in every way, the attractions of both being enhanced by the contrast in the colour of the flowers.

Insects.—Most of the indoor plant pests will live and increase apace upon these Lapagerias; thrips, red spider, and aphides affect them, but these rarely gain a footing if the syringe is used as it ought to be, so as to get the water freely to both the under and upper surface of the leaves. When these insects make their appearance a free and persistent use of the syringe is the best remedy; scale must be removed by the sponge. The temperature they require is not favourable to the increase of mealy bug, although it will live upon them; and when affected it is best removed by sponging, and by the use of a soft brush to get down to the axils of the leaves. There is one other enemy to guard against—that is slugs, which are extremely fond of the young underground shoots, and unless care is taken to keep these marauders thoroughly under they are sure to find the growths as they appear above the surface, in which case serious mischief will be done, as the plants have not the power to quickly produce others to replace the injured ones.

LARDIZABALA BITERNATA.

An evergreen climbing plant that will succeed in a greenhouse. The flowers are not of a pleasing colour, dull purple, but the fruit is edible. It can be increased by cuttings, and grown on afterwards as advised for Passifloras, which see.

It is a native of Chili, and blooms in spring.

LASIANDRA MACRANTHA.

There are two varieties of this evergreen warm greenhouse plant, L. macrantha and L. macrantha floribunda, quite distinct, and both equally well worth growing, but for totally different purposes. In shape the flowers are not unlike Pleroma elegans, but they do not possess the same intense colour; they are, however, much larger, and produced in greater quantities. They are among the grandest of all Melastomads. L. macrantha floribunda was introduced after L. macrantha, and is best adapted for specimen pot culture, being naturally of a bushy habit of growth, blooming profusely in the autumn and winter, when flowering subjects are much in demand and not over-plentiful. It is a free grower, and will flower in a very small state, even in 5 or 6 inch pots; its large, rich, violet-purple blossoms are not of very long duration, like many other Melastomads—some two or three days are as long as they usually last; they are produced in clusters from the points and axils of the leaves of the young shoots, giving a succession for several weeks.

Both varieties are easily struck from cuttings of the soft shoots, put in during spring, as early as they can be obtained, 3 or 4 inches long. Put singly in 3-inch pots, kept close, moist, and shaded in a moderate stove heat, they will root in four or five weeks, when remove the glasses and encourage growth by continuing to keep warm; pinch out the points when they have made a little progress, give a little shade when it is sunny, and syringe overhead in the afternoons. By midsummer move into 6 or 7 inch pots; they will succeed in either peat or loam, the latter being, perhaps, the best; mix a fair amount of sand with the soil, as these plants with their ample foliage require, when in active growth, a good quantity of water. After potting treat as previously until the middle of August, before which time the shoots should again have been stopped. Keep cooler through the autumn, and winter at 45° in the night, until the end of February, when, to give a long season of growth move into pots 4 inches larger. They will be much benefited at this early season by being placed in a house where they can still receive a little more warmth than the generality of greenhouse plants require. Through the spring give them plenty of light until the sun gets very powerful, after which, in the middle of the day, they will need a little shade; give a sufficiency of air during the early part of the day, but close the house with a fair amount of sun-heat, syringing the plants overhead at the same time; do not let them go short of water while in active growth, or it will have the effect of checking root-action, which would seriously interfere with the season's progress. Pinch out the points of the shoots so as to induce the formation of enough branches to furnish the plants well. L. macrantha floribunda is one of the easiest managed subjects in this respect, but must not have this stopping neglected, otherwise it will entail cutting back the strong upright shoots that are formed in the centre of the plant, the removal of which will be so much loss in size. By midsummer, if the progress has been satisfactory, the strongest plants will bear another shift into pots 3 inches larger, and the soil should now be a little more lumpy, and should contain as much of the decayed roots of the grass as can be obtained, potting quite hard. Where a good quantity of fibre exists in soil of this description, this plant will make rapid growth, forming a nice half-specimen the second year. After this summer potting keep them a little closer for a fortnight, using plenty of moisture in the atmosphere, and continuing to damp the plants overhead; keep the strongest shoots well tied out so as to balance their strength, allowing the weaker ones to assume an upright position, which will much increase their growth. About the beginning of August nip out the points of any that are taking the lead; but after this time do not stop any more, or it would interfere with their flowering. Through September withhold shade, give more air, and cease syringing overhead, to effect the ripening process in the growth and formation of flower-buds; by the end of the year, or sometimes earlier, these will be apparent, when the plants should be placed in a temperature of 48° or 50° in the night, to induce them to open freely, when they can be removed to the conservatory, for the decoration of which this subject is most suitable. The temperature here should be similar to such as the plants have been previously in, otherwise the flowers are liable to drop before opening; after blooming remove to a house where they will be kept about 45° in the night, if lower the leaves are apt to suffer, seriously affecting the roots.

About the end of February cut the plants back moderately, and place them where the temperature is a few degrees higher, which will cause them soon to break, after which they should be turned out of the pots and a small portion of the surface-soil removed, giving 3 inches more room, using soil similar to such as hitherto recommended. Tie the strongest branches well out, and treat generally as advised for the preceding season in respect to syringing, shade, and air, with attention to stopping any shoots that are disposed to take the lead too much; but this year the plants will, in all probability, not show so much disposition to make unequal growth. They will not require a second pot this season, but must be subjected in the autumn to the slight ripening process, by withholding shade and a drier condition of the atmosphere. When the bloom-buds begin to swell considerably give them a similar temperature to that of the previous autumn, to open their flowers. The time of blooming may, if desired, be somewhat delayed by keeping the plants in a little lower temperature, but this must not be carried too far, by keeping them either too cool or too long under the retarding process, or the result will most likely be the total loss of the flowers, for this is essentially an autumn and winter blooming subject, and unless by accident which gives it a check or treatment out of the ordinary course, it is not disposed to flower at any other season. After blooming the plants may be again cut back and treated in every way similarly to the preceding year, being given a further shift of 3 inches, and a little of the old soil being removed without disturbing the roots much. When they have bloomed the next autumn it will be best to destroy them, unless where required very large, as young plants are in every way to be preferred, and from their quick and easy growth succession stock can always be brought on to take their place.

The other variety, L. macrantha, when first let out, very much disappointed those who grew it, from its straggling upright habit, which no amount of stopping and attentive cultivation appeared capable of counteracting, and for this reason, in most cases, it was discarded as worthless. It frequently happens that a plant which is admirably adapted for some particular purpose gets a bad character by reason of its inability to conform to a process of culture opposed to its natural habit. Thus it was with this Lasiandra: its straggling growth, although rendering it unfit for growing into a compact bushy specimen, naturally suits it for the purpose of training up a pillar, wall, or rafter; grown in any of these situations in a structure, with a few degrees more warmth in the winter than the ordinary hardwooded house, it is one of the finest flowering plants in existence, blooming for weeks in such profusion that no one, except those who have seen it so employed, can form any idea of the gorgeous effect it produces. It forms large clusters of from a dozen to a score of flowers at the points of the shoots, which keep on opening in succession for weeks together, but to be grown to perfection in such situations it should not be confined to a pot, but should be planted out in a well-drained bed of good loam, to which has been added a liberal admixture of sand, with the addition of a good sprinkling of charcoal or bricks, broken the size of pigeons' eggs, to prevent the soil getting sour.

In thus using this plant, as in the case of many others, the mistake is frequently committed of turning them out whilst in a small state; so treated the soil becomes sour before the plant has enough roots to lay sufficient hold of it. On this point it may be, and frequently is, urged that plants in a state of nature commence their existence, even from the germination of the seed, in an unconfined space, without the soil becoming unsuited for their well-being; but in the open air the conditions of the soil, in common with other things, are altogether different; full exposure to the air and light prevents its becoming in such condition as is inevitable in the best ventilated and light-admitting structure, and in nature's planting it must be borne in mind that all do not grow that come in contact with the soil—only such as happen to be placed under conditions of situation suitable to their requirements. Thus with plants that are intended to be turned out in borders, such as the one under consideration, we have always found, except in the case of extremely strong-growing subjects, that it was much the best way to grow them on for a time in pots until they had acquired considerable strength before turning out, with the precaution, at the time of planting, of spreading the roots out so as to prevent the ill-effects of the spiral root-curve inseparable from pot culture. For the above reason it is better to grow this Lasiandra in a pot for a season, treating it in every way as to soil, water, air, and shading, as has been advised for L. macrantha floribunda, but not to stop the shoots, simply growing the plants on with a single stem until they have attained the height which will best adapt them for the position they are required for. Afterwards it will be necessary to take out the points, so as to induce the formation of shoots to cover sufficiently their allotted space, when they will require nothing more than being kept tied loosely in, with sufficient use of the knife after flowering, to keep them within bounds. In such situations this and other plants frequently get weakly, through the soil becoming impoverished, to prevent which every spring, before active growth commences, an inch or two of the surface-soil should be removed and new added, with an occasional application of manure-water during the growing season; so treated they will last many years.

INSECTS.—Lasiandras are not plants particularly subject to insects. Red spider will sometimes make its appearance if the syringe is not sufficiently used; in such case repeated washings with clean water will be the best remedy, the texture of the leaves being such as not to bear without danger of injury any application of the usual insecticides. Scale, either white or brown, will live upon them; the brown species is usually small and puny, but in such state it is not so easily destroyed as when upon a plant that suits it better, and on which it is found in that peculiar fat condition which indicates good feeding. Where it exists upon these plants, the best way to proceed is, after flowering, to shorten back, cutting away all the leaves and then washing thoroughly with insecticide—repeating this two or three times in the course of ten days. The plants, after this cutting in, should be kept in a temperature of 50°, so as to induce them to break, for it often happens when any plant is headed back, if kept in a temperature too low to excite growth, that it either dies or breaks weakly—the roots, under such condition, generally suffering more than they otherwise would through the severance of the branches. If affected with white scale, they will require cutting back to the hard, mature wood, and dressing with strong insecticide: the mixture should be washed well into the equalities of the bark, and the dressing repeated several times before the plants break into growth.

LASTREA.

A genus of Ferns, containing stove, greenhouse, and hardy species; most of the tender sorts are inferior in appearance to the generality of stove or greenhouse kinds, but those who form collections may deem a few worth growing.

For propagation and cultivation, see Ferns, general details of culture.

STOVE SPECIES.

L. melanocaulon.
L. membranifolia. Isle of Luzon.
L. patens. West Indies.

GREENHOUSE SPECIES.

L. aristata variegata. Japan.
L. decomposita. Australia.
L. decurrens. Japan and China

LATANIA.

A genus of handsome cool stove Palms, of easy culture. They are manageable in size in the early stages of their growth, but as they get old require much room.

The method of propagation and after management will be found under Palms, general details of culture.

L. aurea. This is a very strong grower, with thick leaf-stalks, the leaves are palmate in shape, deeply divided and distinctly plaited. From the Mauritius.

L. rubra. A handsome species, with strong leaf-stalks, red in colour. The leaves, which are palmate, are deeply divided, and distinctly plaited. From the Mauritius.

LESCHENAULTIA.

These fine evergreen greenhouse plants are natives of New Holland; they comprise some half-dozen species and varieties. L. biloba major is justly esteemed as one of the finest plants in cultivation. Its splendid light blue flowers have no equal among plants of this class; they are produced freely from the points of the shoots in spring and summer, and last five or six weeks in beauty. A well-flowered example of this Leschenaultia is not only a fine and attractive subject in itself, but from its distinct habit of growth and colour it harmonises with any other plants, more especially those bearing yellow flowers, such as the Allamandas, from which cause it has always been a favourite with exhibitors. There is no plant that has a more telling effect, or is a greater source of attraction on the exhibition stage, yet here, of late years, it has not been so often seen as in time past. There are several reasons that account for this; it does not attain so large a size as most of the subjects now grown for showing are required to do, consequently where a reasonable uniformity in size is looked for, it is found too small. It is also a short-lived plant, liable to get into bad condition, or go off, without any apparent cause. Nevertheless, it is a subject that deserves a better fate than to get into the list of neglected plants, where there is some danger of its going. It is one of the things the cultivation of which no young plant grower should rest satisfied until he has mastered. It requires different treatment from most other plants, and any attempt to grow it under the exact conditions that some natives of the same country want, will end in failure. Three principal things to observe are:—In potting not a single root must be injured that can be avoided, not even by the removal of the crocks; in the winter it must not be allowed to remain long in a temperature lower than 45°; and it should never be stood in the open air. The first and last of these will cause the stunted condition that it often gets into, and from which it rarely recovers, and a lower temperature than that named will speedily lead to the attack of mildew, to which it is much subject.

To ensure success it is necessary to have free young plants to begin with—without this there is little prospect of their doing well.

This Leschenaultia strikes freely from cuttings made of the points of the young shoots about 3 inches in length, taken off early in spring; put them 2 inches apart in pots filled with sand, cover with a propagating glass, keep moist, and shaded in an intermediate house and they will root in six or eight weeks, when gradually expose them to the full air of the house and pinch off the tops of the shoots—as soon as they begin to move freely putting them singly in 3-inch pots in fine peat to which a good sprinkling of sand has been added;

continue to keep them a little close and in an intermediate temperature with a thin shade in the middle of the day, syringing overhead at shutting up time in the afternoons. By the beginning of August, the points of the shoots should again be pinched out; leave off shading as the autumn draws on, and give more air. Winter near the glass in a temperature of 45° by night, with 10° more in the daytime. In March move them into 6-inch pots, and in the course of a month or 6 weeks they should have the points of the shoots again pinched out. Never let the soil get too dry, and keep the pots stood on a moist bottom but with more air than through the preceding summer, and a little shade when the sun is very powerful, syringe in the afternoons as before up to the middle of August, after which discontinue it, and keep through the autumn and winter as previously. About Christmas nip out all the points of the shoots; it is necessary not to defer this for the plant is a continuous grower, and if the stopping is deferred until spring time is lost. About the end of March remove into pots 3 or 4 inches larger, according to the quantity of roots they have. It is, unlike many hardwooded plants, a very free rooter; it will grow in good fibrous loam, and it is better to give it that than indifferent peat, but where good peat full of fibre is obtainable, it is the best; use it in a lumpy state, not breaking so fine as for most things. If the peat naturally contains but little sand, add one-sixth, and mix well. Instead of turning the plants out in the usual way, which would more or less injure the tender fleshy roots, the pots should be broken. Do not attempt to disturb a single root by removing the drainage, but transfer all together into the new pot; make the soil firm.

The plant is naturally an upright grower, and, as soon as potted, it should have all the strong shoots bent down to a horizontal position, bringing the more vigorous close to the rim of the pot. This will cause them to break back through their whole length. For two or three weeks they should be kept a little closer, and the stage under them sprinkled; but keep them well up to the glass. By the beginning of May they will have taken to the new soil, and be growing freely. Now, as the weather gets warmer, commence to syringe overhead in the afternoons, and close in sun-heat; continue this, and keep the stage and floor damp until the end of August, after which cease the use of the syringe, and keep the house drier, giving more air. Treat through the autumn and winter as in the previous season, keeping the plants tied into shape. Do not now pinch out the points of the shoots until the end of February, as, if strong and stopped so early as in the preceding year, they would most likely set a second lot of flowers, which would seriously interfere with their growth. Pot about the middle of April, the additional root-room they receive must be in accordance with the progress the plants have made; if very strong they will want a 4-inch shift, as heretofore moving the whole mass, roots and crocks; give a little shade in the middle of the day for a few weeks. Train and tie the young shoots well out, so as to keep them in the desired shape, which should be round and bushy, for if allowed to assume the pointed pyramidal form, the higher shoots will take the lead, and starve the branches near the base.

About midsummer stop all the points of the shoots, treat afterwards as before, keeping the plants drier overhead towards autumn, with more air. Give them all the light possible through the winter, but the temperature must not be lower than previously. They will, if all goes well, set bloom freely about March, and must not have any cold current of air admitted upon them, or receive a check in any other way, for if subject to such the blooms will sometimes go blind. If the plants are intended for exhibition the shoots must be properly secured by tying, so that they will not chafe in carriage, or they will be disfigured. If used for decorative purposes they must not be crowded among other things, for in a very few days they would be injured thereby. After flowering shorten the shoots back half way between the points and the place where they were stopped back to in the previous summer. Place them in a house that is kept a little close for a short time until they have broken. When they have made half an inch of growth repot, giving a 2 or 3 inch shift, moving them as before directed in every way, and subjecting them to autumn and winter treatment as in the previous year.

This Leschenaultia is not a long-lived subject, consequently those who grow it should each year start a few young plants to supply the place of those that get worn out and refuse to grow freely. It is sometimes attacked by greenfly, which must be sought for, as they do not thrive well upon it, and consequently are small, and being almost the colour of the leaves, are not easy of detection; notwithstanding, if allowed to remain unmolested even for a short time, they will by the dirt they deposit upon them injure the leaves, which on account of their soft nature are difficult to clean. If the insect gets into the points of the shoots after the flowers are set, it will in a very few days destroy them. When affected with this insect the plants must be fumigated. It is also much subject to mildew, which is almost imperceptible upon it, and not seen until the leaves begin to fall off through its effects. Sulphur is the best remedy, dusted all over, but the parasite is most generally produced by too low a temperature during the winter months—it should never be allowed to fall lower than already indicated.

L. formosa has scarlet flowers, which it opens freely almost all the year round. This is a desirable plant, and deserves more general cultivation than it now receives; it is a smaller grower, easier to manage, and longer-lived than L. biloba: it will in the winter bear keeping cooler, but does much better with a temperature similar to that advised for the blue variety. It is more procumbent in habit, and a much slower grower, and requires somewhat different treatment; it is a finer rooted plant, but is not so impatient of its roots being touched, consequently when potted it should have the crocks removed. The soil should be similar in every way to that already recommended for L. biloba, except that it will be benefited by the addition of a sprinkling of broken crocks, about the size of horse beans. It is a free-rooting subject, and requires more pot-room than its size would lead one to suppose. It does not need much tying to support it, and very little pinching of the shoots, as it is naturally a compact branching plant. To induce it to get on while young, the flowers should be picked out regularly as they are formed. So free of flowering is it that a newly-struck cutting will bloom. In other respects its cultural requirements are the same as for L. biloba. Like the last-named variety it is subject to the attacks of aphides, for which it should be treated in a similar manner.

L. Baxteri major and L. intermedia, bearing orange flowers, are very free growers, similar in habit and in the general treatment they require; they are profuse bloomers, and equally deserving of cultivation, especially for purposes of general decoration.

LEUCADENDRON ARGENTEUM.

This is the only species among a considerable number included in the genus, that finds any favour with cultivators. It is the Witteboom or Silver tree of the Cape; it grows to a good size, reaching a height of 10 or 12 feet, but is pretty in a small state, to which it can be kept for a considerable time under pot-culture. The leaves are silvery-white both on the upper and under surface. It will thrive under treatment such as advised for Rhopalas, which see. A native of the Cape of Good Hope.

LEUCOPOGON.

These are evergreen greenhouse shrubs with neat habit of growth; but although in common with most plants from the same countries they flower freely, they are not sufficiently effective to be rated at more than secondary value for decorative purposes. They thrive under like conditions to those advised for Epacris, which see.

The most desirable are:—

L. Cunninghamii. White. A summer bloomer. Australia.

L. juniperinus. Flowers white, produced in summer. A native of New South Wales.

L. Richei. White; also a summer bloomer. From New Holland.

LIBONIA FLORIBUNDA.

In this we have a small, compact-growing, softwooded plant that bears a profusion of tube-shaped flowers, dull red and orange in colour. Its free-flowering disposition makes it useful for greenhouse decoration, especially in the autumn months.

Cuttings of the soft young shoots should be struck in March, put several together in small pots filled with sand, and stood in a temperature of 60°. Kept moist and shaded, they will root in a fortnight, when move singly into 3-inch pots in loam, to which add some leaf-mould and sand. Stop the shoots and keep in a temperature similar to that in which the cuttings were struck until a little later in the spring, when they have begun to grow freely, after which less heat will suffice. Give a moderate amount of air, with a little shade in sunny weather, syringe overhead daily, and supply water to the roots, as required by other quick-growing plants of a like description. In two months from the first potting enough progress should have been made to admit of the plants being moved to 6 or 7 inch pots, which in most cases will be found big enough to flower them in; now mix some rotten manure with the soil, again stop the points of the shoots, and continue to treat as before. As the pots get filled with roots and the plants come into bloom give manure-water, which will prolong their flowering. Young examples struck in the spring will usually be found most useful, consequently when the blooming is over no more need be kept than will suffice to furnish cuttings the ensuing spring, for which purpose they should be previously cut back and placed in heat so as to secure the requisite growth. It is a native of Brazil.

There is a form of this Libonia with variegated foliage, in other ways not differing from the green-leaved kind.

INSECTS.—To keep down red spider syringe freely, for aphides fumigate with tobacco.

LICUALA.

A handsome genus of mostly low-growing stove Palms, that deserve to be extensively cultivated.

Propagation and cultivation given under Palms, general details of culture.

L. grandis. What the appearance of this magnificent species may turn out to be as it gets older we do not know, but in its early stages of growth it has no equal amongst the fan-leaved section of Palms. It is of stout, moderately close habit; the leaves are fan-shaped, of a medium size, beautifully plaited, and narrowly lobed on the margin. From the South Sea Islands.

L. horrida. A large fan-leaved species; like the preceding the leaves are plaited, and are retained in a healthy condition on the plant, so as to give it a well-furnished appearance. From Java.

LILIUM.

In these we have one of the finest genus of all cultivated flowering plants, differing much in their appearance. Many of the species that thrive out-of-doors in favourable localities succeed better in pots, where, if treated as they require to be, the amount of flowers produced is much in excess of those obtainable in the open air, under all but exceptionally favourable conditions of soil and climate. One of the essential matters in the cultivation of Lilies is never to disturb them when the roots are in an active condition.

The ordinary means of increase is by offsets, which most of the kinds produce freely: these should be removed from established plants at the time of repotting, when the tops have died down after flowering. Never by any means defer the potting until the bulbs have begun to form new roots, which most of the species do a considerable time before top growth commences. As will be understood, the time for removing the offsets varies with the different species that go to rest at different times of the year, and must be regulated thereby. All that is necessary is to turn the plants out of the pots and separate the small offset bulbs from the large flowering ones, putting the small ones four or six together in pots proportionate to their size, being guided still further by the size the particular kind grows to; the pots in all cases should be well drained. Most of the sorts thrive in good rich turfy loam, to which is added a fifth part of well-decomposed leaf-mould, some rotten manure, and sand; the greater part do best when their bulbs are well covered with soil, by placing them about midway down in the pots, pressing the soil moderately firm above. They should then be stood away in a house or pit out of the reach of frost, on a slightly moist bottom so that the moisture in the soil will not get dried up, so as to require much water being given until the shoots appear above the surface; when this occurs they ought to be immediately placed where they will get plenty of light, for if the shoots get at all drawn much harm will be done. After this give water to keep the soil in a sufficiently moist condition for the roots to act, but not too wet. During the early spring the best position for them is a pit or frame where the heads of the plants will be near the glass, and frost can be just excluded. As the shoots advance put a stick to each for support, and give water freely as the soil gets full of roots. When danger from frost is over, the plants are better out-of-doors; if the pots can be plunged in a bed of ashes it will be better for the roots, and there will be less trouble in watering. Continue to supply them with water through the summer until the tops die down, when place them for a few weeks where the soil will be in a medium state as to moisture.

It is well to do whatever potting is required by all bulbs early enough in autumn, not deferring it until the roots begin to move, which, as already said, does much harm. Young plants such as have been one year removed from the flowering pots in the way advised, may be potted on without being disturbed further than by the removal of the loose soil and a portion of the top of the ball; larger pots should be given when necessary, and they should be treated through the winter and ensuing summer as in the preceding. If all goes well the bulbs will this second summer attain size and strength sufficient to enable them to bloom the year following, after which treat as up to this point advised; giving more pot-room when wanted, and removing the offsets and potting them separately. When the large flowering bulbs increase in number, separate them so as to prevent overcrowding. The above course of treatment will answer for most of the kinds of Lilies suitable for pot culture. L. giganteum should be kept singly in all the stages of its growth.

The following are all desirable for pot culture :—

L. auratum. White, with yellow band down the centre of the petals, spotted with red. From Japan.

L. eximium. A dwarf-growing, large white-flowered species ; a fine kind for forcing. Japan.

L. giganteum. A majestic Lily ; the flower-stem in a strong plant grows 10 or 12 feet high, bearing near a score of immense blooms, white, striped with reddish-violet at the base ; very fragrant. From Nepal.

L. Harrisii. An extremely fine and free-blooming variety of L. eximium.

L. japonicum. Has very large flowers, the inner surface white, brown outside. China.

L. Kramerii. Large flowers, of a pale blush colour. Japan.

L. Parkmannii. The new American hybrid, a cross between L. auratum and L. speciosum ; flowers white and crimson.

L. philippinense. Flowers white, 7 or 8 inches long ; very fragrant. Philippine Islands.

L. speciosum album. A white form of L. speciosum. Japan.

L. speciosum punctatum. White, with pale pink spots. Japan.

L. speciosum rubrum. White, spotted and suffused with crimson. Japan.

L. Thunbergianum aureum. A variety of L. Thunbergianum with yellow flowers, nicely spotted. Japan.

L. Thunbergianum grandiflorum. A handsome kind, with orange-red flowers, slightly spotted.

L. Wallichianum. A variety of L. longiflorum, cream-colour, shaded with yellow. From the Himalaya.

L. Washingtonianum. White, striped with lilac ; very fragrant. California.

There are various handsome forms of many of the above species, all desirable for pot culture, that will succeed under the treatment here given.

INSECTS.—Lilies are not much affected with insects except aphides, for the destruction of which fumigate with tobacco.

LINUM.

The kinds of Linum deserving of pot culture are few as compared with the number of species that are known. The sorts, treated of here, are small-growing plants, useful for flowering late in autumn.

They strike readily from shoot cuttings, which should be struck early in spring, put several together in 5 or 6 inch pots in sand, and keep close, moist, and shaded in a temperature of 60°, where they will soon root, when move singly into 3-inch pots in loam or peat, to which add a little leaf-mould and sand. After potting keep them moderately close until they begin to grow, standing them where they will get plenty of light ; keep in a temperature similar to that in which the cuttings were struck until the advanced season renders the use of artificial heat unnecessary. Stop the points of the shoots, give air in the day time, shade from the sun and syringe overhead freely every afternoon ; this is necessary as these plants are more subject to red spider than most things. Again stop the shoots, and in June move them into 6 or 7 inch pots, which in most cases will be large enough for them to bloom in. After this time an ordinary unheated pit will answer for them, and they should be placed where they will get plenty of light and air, with a little shade until the end of August, when they will be better without ; syringe regularly daily up to this time. As the weather gets colder the plants should have a little warmth, which will assist their flowering.

When the blooming is over enough should be kept to furnish cuttings in the spring, and if it is thought desirable to grow some on a second season these may be retained and cut well in in March ; after they have broke shake part of the old soil away, give pots a size or two larger, and treat afterwards as in the previous summer.

The kinds best worth growing are :—

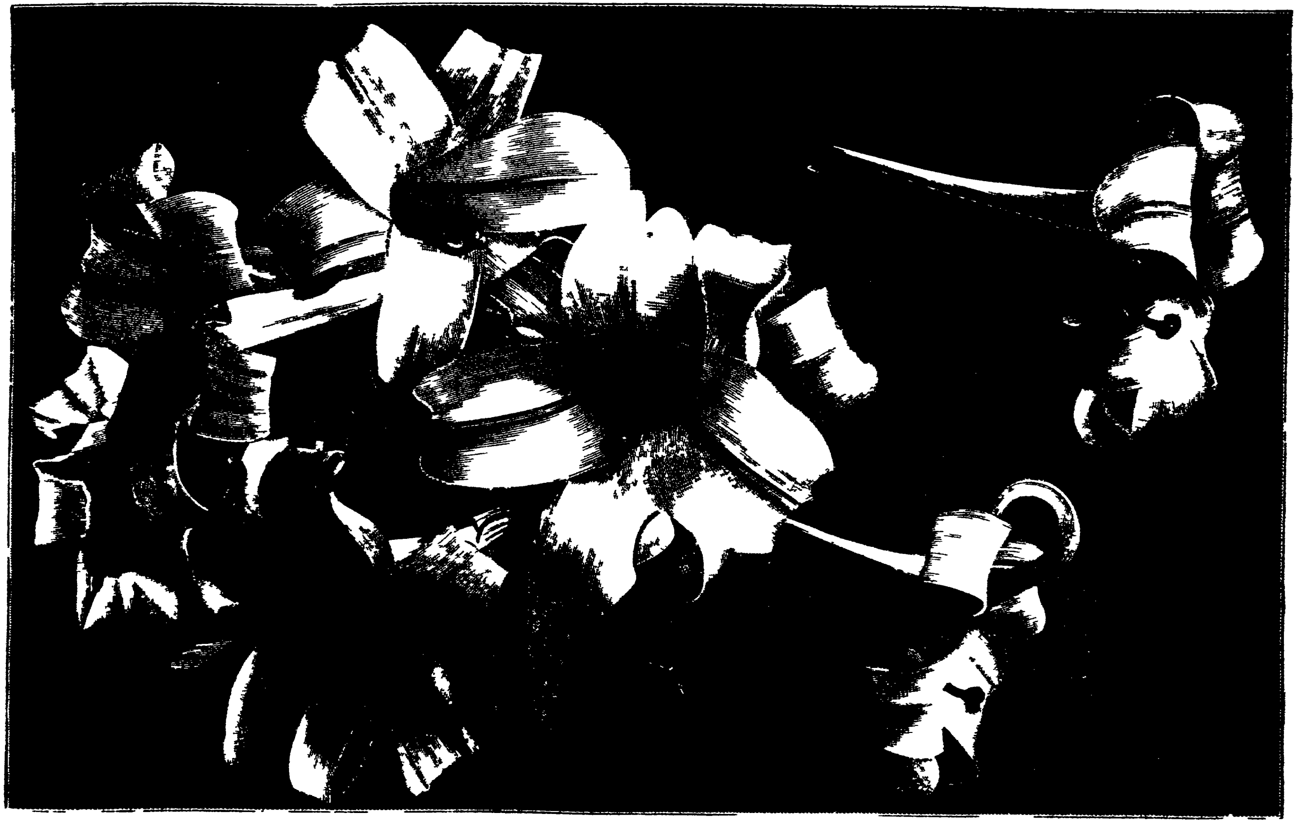
L. flavum. Flowers yellow, blooms in autumn. A native of Southern Europe.

L. trigynum. Yellow flowers, produced in summer and autumn. An Indian species.

INSECTS.—The regular use of the syringe advised will keep down red spider. For aphides, which sometimes attack them, fumigate with tobacco.

LISIANTHUS RUSSELLIANUS.

In this Lisianthus we have one of the most beautiful of all biennial stove plants. Its splendid purple campanulate flowers, produced in large terminal panicles, never fail to render it attractive—so much so, that few who see it in bloom and possess the necessary means for growing it fail to make the attempt. From this it might be supposed that it would be much more



Lilium Harrisi

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common than it is, but it is well to mention at the outset that it is a difficult subject to deal with; nevertheless it is well worth all the attention that can be bestowed on it. Lisianthus Russellianus is indigenous to Texas, and it must have special treatment, for, unless well managed, it gives a very imperfect idea of its beauty. The seeds should be sown in February; if deferred later the plants do not acquire their wonted strength before autumn. Drain well a 7-inch or 8-inch pot, and then fill it up to within half an inch of the rim with fine sifted peat, to which has been added a moderate quantity of sand; press this firmly down, and on the top lay half an inch of sand, which water well and press the surface smooth; on this scatter the seeds, just pressing them lightly with the hand so as to embed them in the sand; put a piece of glass that will cover the top of the pot over it, and stand in a saucer, which keep with about an inch of water in it. Place in a temperature of 65°, and shade carefully from the sun, so that the surface whereon the seeds are sown may not get dry, for no water should be given overhead until the plants have got two pairs of leaves. As soon as the seed has vegetated stand where the seedlings will get plenty of light, but they must not have the sun directly upon them. A piece of thin white tissue paper we have found the best material for protecting them without keeping out the light. Now give enough water to keep the soil well moistened, with some air daily, and when they have got three pairs of leaves move them singly into little pots.

A moderate stove temperature will answer through the summer; pinch out the points of the shoots directly they commence to grow after potting; repeat this once more about the middle of July, and move them into 3-inch pots, using fibrous peat and a little leaf-mould. In September they should be placed on a shelf within 12 inches or 15 inches of the roof, standing the pots in shallow pans; give no more water through the winter on the surface, but when the soil appears to be getting too dry pour about half-an-inch into the pans —it will then be sucked up by the plants. They must not be allowed to get so dry as to flag, or they will be seriously injured, and they will not bear water applied to the surface during the winter, as it almost invariably causes them to damp off. A temperature of 50° in the night will suit them until the middle of March. An intermediate Orchid house answers for them through the winter. About the time above named they will require moving into their blooming pots. They should now have a large shift; an 8-inch pot will not be too big for a single plant, and good peat with a little leaf-mould and sand should be used. A 12-inch pot will do for three plants, putting them close together in the middle; they should still have a position with their heads near the glass, and again be shaded when the sun comes on them. The night temperature ought now to be 60°, and that of the day 70° or 75°; they must have as much water as will keep the soil fairly moist; the shoots will grow fast, and will each want a thin stick to support them. As the weather gets warmer raise the heat to 65° or 66° in the night and 80° by day, with air daily, and a moderately moist atmosphere.

By the end of May they will show flower, which will take five or six weeks before it expands. They will keep on blooming for five or six weeks, during which time the plants may be stood where they will be a little cooler, but not have too much air or be in a draught. They can now be placed further from the glass, where they will be seen more to advantage. After blooming keep on attending to them until the seed is ripe, when it is best to throw them away, bringing on young seedlings each year to take their place.

INSECTS.—This Lisianthus is liable to the attacks of aphides, red spider and thrips, especially the last. Dipping in tobacco water and sponging with clean water is the most successful remedy.

LITOBROCHIA.

A genus of Ferns, most of which are stove species; they are pretty, and sufficiently distinct from others to make a few representatives of the genus worth growing. For propagation and cultivation, see Ferns, general details of culture.

L. aurita. Isle of Luzon.

L. davallioides.

LITTONIA MODESTA.

This is a stove plant of a scandent habit of growth. It is suitable for clothing a pillar, or rafter, or may be trained on a trellis. The flowers are campanulate in shape, of a dark yellow, or orange colour. It requires similar treatment to the Gloriosas, which see. Africa.

LIVISTONA.

A noble genus of large-growing stove Palms, that require much room to be seen in a fairly developed state.

The method of propagation and after management will be found under Palms, general details of culture.

L. altissima. A strong-growing species, with stout, heavily-spined leaf stalks; the leaves are large, fan-shaped, plaited, and deeply divided. Java.

L. chinensis (syn.: Latania borbonica). One of the most remarkable of all Palms; its immense leaves spread horizontally so as to occupy a large space, when the plant gets old, in which state the trunk is thick and massive. The leaves are fan-shaped and deeply divided. It comes from India.

LOMARIA.

Many of the species of this genus of Ferns are sufficiently distinct in character to be well worth growing; the greenhouse kinds will be found the most desirable. Several assume a miniature Tree form, and can be employed for decorative use in many ways. L. gibba is one of the favourites in Covent Garden Market.

For propagation and cultivation, see Ferns, general details of culture.

L. cycadifolia. Juan Fernandez.
L. discolor. Brazil.
L. Dalgairnsiæ. South Africa.
L. Fraserii. New Zealand.
L. gibba. New Caledonia.
L. gibba crispa.
L. Zamiæfolia.

LOMATIA.

These are very distinct and handsome, slow-growing, hardwooded evergreen greenhouse shrubs. Their foliage is beautifully subdivided like that of some Ferns, and it endures in a healthy condition on the plants much longer than that of most things.

They are propagated from shoot cuttings which are somewhat difficult to strike; the cuttings may be put in at the latter part of summer when the wood is nearly in a mature state, and stood in a cool greenhouse, covered with a propagating glass, and kept moist through the winter until they are callused over. Put them in heat where they will root, and then move singly into small pots in turfy peat, broken fine, with some sand added, keep them in an intermediate heat until they have got well established, after which a greenhouse temperature will suffice. When a little growth has been made pinch out the points of the shoots; this must be attended to once or twice each season for two or three years, or they will get thin of branches, which will ultimately cause them to become naked at the bottom. Each spring they should have pots a size or two larger, but they must not be over-potted, as they are slow growers, and will keep on improving for many years. Should the plants ever get bare at the bottom they ought to be headed down in spring just before they begin to grow, the effect of which treatment will be to make them more dense and bushy, and in every way more handsome than when younger.

L. elegantissima. This it a slender-growing species, with the divisions of the leaves finely cut, giving it a very distinct appearance.

L. silaifolia. A handsome kind, with dark-green, deeply-cut leaves; it forms a dense bush, and is remarkably elegant.

Both are from New South Wales.

INSECTS.—The texture of the leaves is such that few insects molest them except scale, which, if present, must be removed by sponging.

LOPHOSPERMUM.

Climbers suitable for growing on the roof or pillars of a greenhouse. The flowers are produced freely, and have a pretty effect.

They are easily raised from seeds or cuttings of the shoots, which strike readily in spring in sand, kept moist, close, and shaded in a temperature of 65° or 70°; when rooted move singly into 3-inch pots—soil composed of peat and a little sand suits them best; grow on with a little shade when the weather is such as to require it, with air and a free use of the syringe daily. About midsummer move the plants into 6 or 7 inch pots, and grow on as before. Winter in a temperature of 45°, and in spring give more root-room, training the shoots to the place they are to occupy. All that is needful afterwards is to see that the shoots do not get entangled, and to give additional room as required.

The following are the kinds most worthy of being grown:—

L. erubescens. Has rose-coloured flowers, produced in summer. From Talapa.

L. erubescens maculatum. Flowers purple and white. A hybrid that blooms in summer.

L. Hendersonii. A pretty variety with rose-coloured flowers produced in summer.

L. scandens. Flowers purple and violet, a summer bloomer. From Mexico.

INSECTS.—Syringe freely through the growing season to keep down red spider; for aphides fumigate.

LUCULIA GRATISSIMA.

In this fine evergreen shrub we have vigorous growth, a remarkably free habit of flowering, delicious fragrance, and a disposition to bloom through the autumn—a combination of good properties surpassed by few plants in cultivation. Considering the length of the time during which it has been known in this country—over half a century—it seems strange that it is not more generally met with than it is, and this can only be accounted for by the fact that it does better with a little more warmth than that of a greenhouse, and yet cannot bear so high a range of temperature as most of the occupants of the stove, where, if kept, growth is so much over-excited, that it appears never to have time to flower, or if it does the bloom is of a meagre description. With sufficient room this plant attains a considerable size, reaching where desired a height of 14 or 16 feet when trained so as to occupy the end or back wall of the house in which it is located. For this purpose few plants are more suitable, and in such positions its clusters of pinkish-white flowers are most effective. It is equally suitable for training round a pillar, or it can be grown in a pot or tub, trained bush fashion, for which its natural habit adapts it. But although, from its free disposition to flower, it will bloom in a small state, to have it in a condition such as to exhibit its full beauty when grown as a bush, it should not be stinted for root-room, nor should the head be too much cut in.

It is propagated by cuttings of the young shoots, which should be put in early in spring—say in the beginning of March, for with this, as with most things of like character, it is of importance to start sufficiently early to admit of the plants attaining size and strength before autumn. There is one thing connected with this Luculia that it is necessary to impress on the cultivator—that is, the cuttings must never be allowed to flag, for if they do they rarely afterwards succeed. Insert them singly in small pots, drained and half filled with a mixture of sandy loam and peat, the upper portion sand. Keep them moist, cover with a bell-glass, and let them have a night temperature of from 60° to 65°. They take longer to strike than many plants. When rooted, gradually admit air until the propagating glass can be dispensed with altogether, when the young plants should be placed where they will receive plenty of light. As soon as growth commences pinch out the points so as to induce the formation of several shoots near the base. When the pots are fairly filled with roots shift at once into others 4 inches larger, using a mixture of two-thirds loam to one-third peat. A liberal sprinkling of sand is indispensable, as, being of fairly free growth, the plant requires a plentiful application of water during the growing season. A night temperature of 60° through the summer will be sufficient, with a rise in the day proportionate to the state of the weather, for, being a native of the high, comparatively cool, yet humid, country of Nepaul, it will do better in such a temperature than if warmer. A little shade in the middle of the day during very bright weather will be an advantage. Syringe freely in the afternoons. So managed the young plants will make satisfactory progress.

Treat as already advised until the middle of September; then dispense with the shading, and give more air, but keep on syringing for another month, after which it may be discontinued. A night temperature through the winter of from 46° to 50° will suit the plants, which should be kept drier at the roots, but on no account should moisture be withheld even at this season to the extent that some things would bear, for it must always be borne in mind that the moisture-loving nature of these hill-region plants does not in any way change under cultivation, and if ever kept too dry they get into a languid state, and are made susceptible to the attacks of red spider and other insect pests, which appear to prefer preying upon plant life when under conditions that reduce its vital force. By the middle of March they may have a 3 or 4 inch shift, now using the soil in a more lumpy state, if possible containing more fibrous matter. Pot firmly by ramming the new material well in, which, with most plants, has the effect of inducing a more bushy habit of growth, with shorter-jointed wood, more disposed for an even production of flowers than the few gross, over-luxuriant shoots generally resulting from light potting. Pinch out the points of any shoots that are taking an undue lead, train the strongest growths out to sticks inserted just within the rims of the pots, and leave the weaker ones in a more erect position, by which means they will acquire strength to an extent that will more evenly balance the plants. All now required through the summer is to treat as recommended the previous season, giving them liberal applications of water at the roots and syringing freely. By the beginning of September the plants will push up strongly, and when in bloom they can be removed to a conservatory kept at a temperature in accordance with their requirements. When the flowering is over they may be moderately shortened back and kept on through the winter as before, giving them a liberal shift in the spring, and, to still further promote growth, supply them with manure-water during the summer. They will this season make fine decorative objects when in bloom, after which treat as previously, giving more root-room as required. Where intended for planting out, a moderate extent of border must be prepared, sufficiently drained by means of a layer of 2 or 3 inches of broken bricks, pebbles, or anything of a similar character. The plants should be turned out in the spring just before growth commences; if delayed until later on, some check to the young shoots will follow the necessary disturbance of the roots, which, if coiled to any extent round the ball, should be loosened so as to be directed into the new soil; make this moderately firm, otherwise the water will pass through and leave the ball dry, a condition essentially opposed to free growth. When preparing the soil, if, in addition to sand, a sprinkling of broken sandstone or potsherds is added to it, it will benefit the plants, as we have always noticed that the material in inside borders is more disposed to get into a sour, unhealthy state than when it is fully exposed to the open air. The plants should be spread out to cover the wall or end of the house, as the case may be, so as to furnish the whole properly from the first, as where attention is not paid to this matter the growth is naturally directed upwards, leaving the lower space deficient, a condition which it is afterwards difficult to remedy. Where a pillar has to be clothed it will be well, instead of stopping the plants, so as to induce their branching out more than requisite, to allow one or two of the strongest shoots to take the lead so as to attain the required height, merely pinching the points at intervals that will cause them to sufficiently furnish the space as they progress.

L. Pinceana. A native of Nepaul, has white flowers, sometimes slightly tinged with pink. It requires treatment such as advised for L. gratissima.

INSECTS.—The less injurious kinds of insects will in a great measure be kept down by the syringing advised. If affected with scale or bugs, syringe and sponge with insecticide.

LYGODIUM.

A genus of climbing or twining Ferns, comprising stove and greenhouse species; among them are some alike remarkable for their elegant and distinct habit. Varying as they do so much from other Ferns they are worthy of being much more grown than they are at present. The slender thread-like shoots of L. scandens are very effective when used in arrangements of cut flowers.

For propagation and cultivation, see Ferns, general details of culture.

STOVE SPECIES.

L. lanceolatum.
L. polystachyum. Malay Archipelago.

GREENHOUSE SPECIES.

L. articulatum. New Zealand.
L. japonicum. Japan.
L. scandens. East Indies.

MACKAYA BELLA.

There are few plants which have been introduced to this country in recent years that produce such lovely flowers as this Acanthad. It is a native of South Africa, and has so far been found a somewhat shy bloomer, but this most likely is owing to its requirements as to temperature not being sufficiently understood, as it evidently is one of a number of beautiful flowering species we possess that will only bloom meagrely or not at all if grown in a hot stove temperature, and yet do not succeed well with the warmth of a greenhouse. It is propagated by cuttings of the young shoots produced after flowering. These can be obtained about midsummer. They should be put singly in small pots in sand under a bell-glass in a temperature of 70°, kept moist, close, and shaded. They will soon root, and then should be gradually allowed more air; keep them close to the light, and directly they are well furnished with roots, move them into 6-inch pots in turfy loam, with some sand; pinch the points out to induce bushy growth. The heat of a cool stove or intermediate house is what is required, with more air than stove plants generally like, and no more shade than is found needful to keep the leaves from scorching; syringe daily until autumn; then keep the atmosphere drier and allow the soil to get a little drier also. A night temperature of 45° to 50° will suit the plants through the winter, with a rise in the daytime, more or less, as the weather varies; from 55° to 58° will be right.

In March increase the warmth 5° in the night, and to 60° or 65° by day, moving them into 10-inch pots; raise the temperature as the weather gets warmer, giving air and syringing as in the preceding summer; again pinch the points of any shoots that are out-growing the others. By July the pots should be so far filled with roots as to necessitate another shift, that is if pot culture is to be the course followed; if not, they should be planted out in a prepared border of limited extent, so as not to give the roots too much room to run, well drained, and filled with good free loam; in either case encourage all the growth possible until the end of September, after which time give no more water than is requisite to keep the leaves from flagging, and winter as before. Early in March increase the temperature to 50° or 55°, and give a good watering; this will have the effect of inducing the flowers to push. As the bloom-buds begin to swell increase the heat a few degrees more, which maintain until the blooming is over; then shorten the shoots in moderately, and if the plants have been in pots they will require a 5 or 6 inch shift; treat in every way as advised for the preceding summer, and again similarly in winter.

The spring following the plants should make a fine display. They will last for years provided the soil, if they are in pots, is partially renewed, and growth is still further assisted by manure-water; if planted out, give soil to the surface of the bed when required, with a good soaking of manure-water when the summer growth is making progress.

INSECTS.—If red spider or aphides make their appearance fumigate with tobacco or syringe with insecticide. Should mealy bug or scale attack the plants they must be removed by syringing with insecticide.

MACLEANIA.

A small genus of plants possessing considerable beauty in their flowers, but little grown.

They are increased by shoot cuttings, which strike best if put in during spring, and treated in the ordinary way in a warm close atmosphere; pot them when rooted, and grow on in peaty soil in an intermediate temperature.

M. longiflora. An evergreen shrub, bearing red, tube-shaped flowers, which open late on in spring. From Peru.

M. pulchra. A shrubby evergreen species with vivid red flowers, yellow at the extremities; a summer bloomer. From New Grenada.

M. speciosissima. A very interesting shrub, differing much in appearance from the above-named kinds, inasmuch as it is of drooping habit. The flowers are scarlet and yellow. It comes from Columbia.

INSECTS.—Aphides and red spider will both live and thrive apace on these plants; to keep free from the latter syringe regularly through the growing season. For aphides, dip in tobacco-water or fumigate.

MACROZAMIA.

These belong to the Cycad family, and are a very distinct and handsome section of the genus. They are nearly related to the Zamias. Their cultivation is similar to the cooler Cycas, which see.

The following is a selection of desirable kinds:—

M. cylindrica. A handsome sort, with long, dark green, pinnatifid leaves, with ivory markings at the base. From Queensland.

M. MacKenzii. A distinct-looking kind that attains a moderate size. Queensland.

M. plumosa. A plant of moderate growth; the leaves being twisted in a spiral fashion give it a singular appearance. Queensland.

MAGNOLIA FUSCATA.

This plant comes from China, and belongs to a genus almost all of which assume the proportions of moderate-sized trees, and are too large for cultivation under glass. It may be increased by cuttings made of the points of the shoots late in summer when the wood is nearly ripe, put singly in small pots in sand, covered with a bell-glass, and stood in a cool greenhouse or pit and kept cool until they are callused over at the bottom, when they should be put in a temperature of about 50°, where they will root before spring. Then move them into 6-inch pots and keep them in a temperature like that in which they have made roots, until further on in the season. When some progress has been made in top growth, pinch out the points of the shoots and give air daily, with a little shade in very hot weather. Ordinary greenhouse treatment will be all that is now needed, syringing regularly overhead. By the end of June the plants will bear putting into 10-inch pots—good turfy loam with a little sand is the material required. Again pinch out the points of the shoots, and continue to treat as before until autumn. Winter in a temperature of 40°, in spring give larger pots, and treat through the growing season as in the summer previous. The plants will grow fast now, and will be large enough to bloom nicely the following year. The flowers are of a brown colour. This Magnolia forms a large bush, and is best suited to a large cool house, where it will go on for years if given enough root-room, with the assistance of manure-water.

INSECTS.—Syringe freely to keep down red spider. Should aphides become troublesome fumigate with tobacco.

MANDEVILLA SUAVEOLENS.

In this we have one of the most desirable plants for decorating the roof of a cool conservatory or greenhouse. It is a climber of moderate growth, bearing pure white trumpet-shaped flowers, very handsome, and highly fragrant. Its flowers are produced freely through the summer and autumn; it is very distinct in appearance, and is in every way a much more suitable plant for a roof-climber than numbers that are more generally grown. In addition to the properties already mentioned it has the important advantage over many conservatory climbers of not being over-rampant in habit. The deciduous habit of the Mandevilla prevents any injury being done by shading through the winter months to plants grown under it, when all the light that can be obtained is required. In no way is the plant seen better than when planted in the centre of one end of a span-roofed house, and trained up along under the ridge, from which its blooming shoots will hang in festoons; a very few flowers will scent a large house. It is not an over strong rooted subject, and will grow more freely if planted in peat than loam, although it will do in the latter. It is not suitable for growing as a pot specimen, consequently it is better to treat only upon its culture as a climber. It comes from Buenos Ayres. Like other subjects of not over-strong habit, if turned out when small into a considerable body of soil in an open border, the chances are against its doing well. It can be raised from seeds or from cuttings, the last-named method will be more within the reach of most cultivators. Cuttings such as required will be found in the right condition about May, in the shape of young shoots that have been made by established plants that have been cut in and have broken fresh growth; when these are 4 or 5 inches long take them off with a heel and put singly in small pots half filled with sand and peat, the top all sand. Kept moist, shaded, and covered with a propagating glass, in an intermediate temperature they will soon root, after which dispense with the glass, and encourage growth by continuing a growing temperature and syringing daily overhead. By the middle of July the young plants should be ready for moving into 3 or 4 inch pots, using soil made moderately fine, with some sand in it; keep close until the roots begin to move freely, after which admit more air. A stick should be placed to each plant, to which the shoots should be trained; give a little shade all through the summer when the sun is powerful, towards autumn admit more air, keep the atmosphere drier, and leave off syringing. Keep at a greenhouse temperature through the winter, and about the beginning of April move into 6-inch pots, treating subsequently during the summer as in the last, giving to each plant a tall stick, to which train the shoots. Winter as before, and about the beginning of April if well-rooted give a 3-inch shift, use good fibrous peat, to which add one-sixth of sand, drain the pots well and pot firm, inserting just inside the rim three or four 4-feet sticks, round which through the season keep the shoots regularly trained. While young they are tender, and if allowed to get entwined in each other they will be difficult to separate, and are almost certain to receive injury in the operation. When potted, place them in a house or pit where they can be kept moderately close for a short time; a temperature of 50° in the night, with a rise in the day according to the state of the weather, will answer for them. Do not give much air for a few weeks until the roots have begun to enter the new soil, only so far as requisite to keep the temperature from rising too high. When they show signs of growing freely, give plenty of air in good time in the morning and during the day, closing sufficiently soon to raise the temperature considerably by sun-heat. The plants will now need more water at the roots, and as the season advances it will be necessary to use the syringe more freely than requisite with many things, as it is subject to red spider. To keep this pest in check the whole of the leaves, on both the upper and under surface, should be reached by the water. Continue this treatment through the summer, shading a little when the sun is very bright, and moistening the atmosphere by sprinkling the paths and under the stages. Keep on treating in this way until the beginning of September, when they should be no longer syringed or shaded; give abundance of air so as to discourage further growth and to ripen up the wood.

Keep them through the winter at an ordinary greenhouse temperature of 35° or 40° in the night until the end of March, when they should be planted out where they are to remain. The border ought to be sufficiently drained, and the drainage secured from becoming clogged up with the soil; this will occur through the action of worms, which will assuredly get into it unless the crocks are well covered with enough fibrous material that will not soon decompose. To the want of sufficient provision of this kind may be attributed the frequent non-success with climbers that are not of an over-vigorous habit. The soil in conservatory borders is, owing to the position in which it is placed, in a great measure out of the reach of sun and air, and generally has numbers of plants in pots standing upon it, with the water from them continually descending into it. The necessity will therefore at once be apparent of taking all possible care in making these borders, to use such materials, and so put them together, as to secure their keeping in an open porous condition. For this and similar growing plants one-sixth of charcoal, broken about the size of Horse Chestnuts will much increase the porosity of the soil; let the peat be of the best fibrous description, use it in a lumpy state, and in addition to the charcoal add one-sixth of coarse sand; the border, independent of the drainage, should be 9 or 10 inches deep. In planting, spread the roots well out, and do not cover them too deep—about 4 inches will be enough; give as much water as will keep the soil in a healthy condition, but not more. The shoots should at once be trained to the wires, and run up to the roof without any attempt to induce them to break out, as it is from the roof that the flowers, to be effective, should be produced. Nothing more will be required than attention to training, giving water to the roots, and constant daily use of the syringe during the growing season. When the plants have filled their allotted space whatever cutting-in is found requisite should be done each winter, but do not to this Mandevilla use the knife any more than is necessary. In the course of two or three years, if the soil shows signs of getting exhausted, remove 2 or 3 inches in the spring, replace it with new, and assist the plants through the growing season with manure-water.

Insects.—This plant is liable to red spider, but if the precaution already advised, of constant use of the syringe during the spring and summer is attended to, they will never gain a footing. Aphides will sometimes make their appearance on the young shoots and are best destroyed by fumigation.

MANETTIA.

These form a small genus of evergreen twining plants suitable for growing on the roof of a cool stove or intermediate house. They are of a comparatively thin habit of growth, which well adapts them for draping the roof of a house where other things growing underneath do not want much shade. For this purpose Manettias might with advantage be much more grown than they are; their small, tube-shaped, bright coloured flowers are produced in such profusion as to make them very attractive. They strike freely in the spring from cuttings made of the young shoots in a somewhat immature state. These may be put in an inch apart round the side of a 5 or 6 inch pot in sand; if kept close and moist, they will soon form roots; after being fairly established, move singly into 3-inch pots in sandy peat. When the young plants have got into active growth pinch out their points, and place a few thin sticks for each to twine round. A moderate stove temperature suits them best, with a little shade when it is very hot; stand them in a light place, and syringe overhead daily. Towards the end of June give them 7 or 8 inch pots, keeping the shoots from getting entangled. It is particularly necessary to attend to this until placed where they are to remain. Treat during the autumn so as to mature the growth rather than to encourage extension. A temperature of 55° will answer through the winter. In the spring the plants will require 10 or 12 inch pots; make the soil moderately firm in potting. Those that are to be grown as trained specimens will need either wire trellises or several sticks inserted just inside the pots; round them the shoots must be regularly trained until they have covered the whole, after which they may be allowed to ramble more freely. Where to be trained to a rafter the growths must at first be kept to the wires intended to support them till these are furnished, and they may be allowed more freedom afterwards. So far as water, heat, air, and shade are concerned, treat them as in the first summer. The plants bloom profusely, generally remaining in flower all through the latter part of summer and autumn, after which they may be partially cut in, kept cooler and drier as before during the winter. Give more pot-room in spring, according to the extent of space the plants are intended to occupy.

The following two species are deserving of cultivation:—

M. bicolor. Flowers scarlet and yellow, a most profuse bloomer; comes from Rio de Janeiro.

M. micans. Red and orange coloured flowers, very pretty, and, like M. bicolor, very easily grown; it comes from Peru.

INSECTS.—Manettias are subject to red spider and aphides; the former are easily kept under by syringing daily during the growing season. Dip in tobacco-water or fumigate to kill aphides. If attacked with mealy bug, syringe with insecticide.

MARANTA.

Marantas, which are very handsome stove fine-leaved plants, differ considerably as regards the size to which they grow. Among the numbers that have been introduced of late years, there is to be found great variety with respect to the marking of the leaves, some having the surface beautifully variegated with broad well-defined blotches, others with delicate hues of distinct colour running through a considerable part of their leaf-blades. They mostly belong to hot regions, and, therefore, require a good deal of warmth. They are not so quickly propagated as plants that can be struck from cuttings; they are increased by division of the crowns early in spring just before growth commences; the most suitable plants for the purpose are such as have grown to a considerable size and consist of numerous crowns. About the beginning of March turn them out of their pots, shake most of the soil away from the roots, and disentangle them as far as can be done; after that, with the help of a knife, the whole may be reduced to single crowns if desired, or they can be simply divided into two or more pieces as occasion may require; in the latter case each portion should be placed in a pot that will allow space enough for the roots and a fair quantity of new soil. If a total separation of the crowns has been effected, each piece should be put in a 5 or 6 inch pot, or whatever size is found sufficient to hold them, with as much soil as seems requisite for the roots to ramble in. Marantas like a moderately moist atmosphere with shade when the sun gets powerful, otherwise their rich glossy appearance will be lost. Sufficient water should be given to slightly moisten the new soil, and where they have been much divided they should have a confined atmosphere, such as that afforded by a propagating frame until they root, and the young buds, which will break from the crowns of the old growth, begin to move; after that inure them to the full air of the house.

After division in this way they should be kept in a temperature of 60° or 65° at night, with a rise by day proportionate to the state of the weather. As the summer advances they will bear more warmth, but it is not well to keep them too hot, and although, as already stated, they will not do with exposure to full sunshine, they must not be over-much darkened and kept too far from the glass, or the growth made will be so soft and tender as not to stand even for a short time later on in the summer removal to a cooler atmosphere, which such plants are often required to bear. To still further induce a robust condition they should have a moderate quantity of air admitted for a time each day during the growing season, with the atmosphere fairly moist; they should also at that period be syringed daily. By the beginning of July those that seem to require more room ought to have pots a little larger. They will succeed in either peat or loam; in the latter their leaves are often higher coloured than in peat, in which they grow fastest. In autumn discontinue shading and the use of the syringe, and give a little more air. A temperature of 60° in the night during winter will suffice. All afterwards required is pot-room proportionate to the size to which the plants are wanted to grow.

The following are distinct and beautiful kinds:—

M. albo-lineata. A fine kind from Colombia of stout habit; ground colour pale green, with narrow, distinct white lines running partly through the outer portion of the leaf-blade.

M. bella. Handsomely variegated with pale greyish green and dark green in the way of M. Makoyana; Brazil.

M. concinna. Leaves light green, blotched with blackish green; South America.

M. inscripta. A medium-growing species. The undersides of the leaves are red: upper surface clouded green, distinctly barred with white; Brazil.

M. leopardina. An erect-habited kind that has medium-sized leaves, pale green, regularly barred with dark green; Brazil.

M. leuconeura Massangeana. A small-growing kind of distinct appearance; midrib banded on each side with grey, lined and blotched with greyish white and reddish brown; Brazil.

M. Makoyana. A dwarf-growing species, the leaves of which are of a greyish white ground colour, and furnished with broad oblong blotches of bottle-green with paler lines running through them.

M. nitens. A handsome small-growing species, with bright green leaves, regularly

Maranta Zebrina, and other fine-leaved plants. *To face page* 246.

variegated with conspicuous dark-coloured markings; from Brazil.

M. orbifolia. This comes from Brazil, and has very broad short leaves of a green colour, with greyish oblique streaks.

M. ornata. A Bornean species with small roundish leaves, distinctly and handsomely variegated.

M. pruinata. An elegant kind from Nicaragua, with narrow leaves of a deep green shade, obliquely ribbed.

M. pulchella. A small-growing species. The leaves are short, of a bright green colour, blotched with darker green; Brazil.

M. regalis. A species that attains a moderate size; ground colour dark green with handsome red lines.

M. roseo-lineata. A neat-habited kind with glossy green leaves, distinctly marked with red; Colombia.

M. Seemannii. A beautiful, bright green, velvety-leaved kind, with whitish midrib. Introduced from Nicaragua.

M. Veitchii. A handsome species from Peru, with large finely-marked leaves.

M. vittata. A strong-growing species with large, stout, glossy, pale green leaves, handsomely variegated with distinct white lines.

M. Warscewiczii. Another strong-growing sort very distinctly variegated. A native of Central America.

INSECTS.—Marantas are liable to the attacks of most insects that affect stove plants, but, from the formation of their leaves, they can be easily cleaned by syringing and sponging.

MARATTIA.

A small genus of Ferns, comprising stove and greenhouse species. By those who aim at growing large collections of Ferns, where it is desirable to bring together as many distinct forms as possible, a few of them may be introduced; but, taken collectively, they are coarse-growing kinds, devoid of the graceful elegance common to so many of the order.

For propagation and cultivation, see Ferns, general details of culture.

STOVE SPECIES.

M. alata. West Indies.
M. Cooperii. New Caledonia.

GREENHOUSE SPECIES.

M. elegans. New Zealand.

MARCGRAVIA.

These are clinging stove plants suitable for covering bare walls where many things would not succeed, in the way Ficus repens is often used. M. paradoxa is a most singular species in its habit; the leaves are borne on the stem alternately, like those of some Ivies, with an exact regularity such as is found in few, if any other plants.

Their propagation and after treatment is very simple; cuttings strike freely managed in the usual way, and as soon as established should be placed against the wall, rafter, or pillar which they are intended to cover, and to which the stems as they advance will adhere. They require the ordinary conditions of shade and moisture, with a moderate amount of air and a warm stove temperature summer and winter. The flowers are inconspicuous.

M. paradoxa. Comes from Nicaragua.

M. picta is a native of Guiana.

INSECTS.—These plants are not much troubled with insects; scale sometimes establishes itself on the leaves, for which sponge with clean water.

MARTINEZIA.

A small genus of pretty stove Palms, distinct in appearance.

Propagation and cultivation given under Palms, general details of culture.

M. granatensis. A dwarf species, with well-marked habit of growth. From Colombia.

M. Lindenii. A comparatively new species, with stout pinnate leaves. South America.

MAURANDYA.

Evergreen greenhouse twining plants of neat habit that produce pretty flowers freely over a length of time. They are suitable for training round a pillar, or in other positions of like description, where larger-growing plants would be unsuitable. They can be raised from seeds, or cuttings struck and grown on in the way advised for Lophospermums, which see.

The following are the kinds in cultivation:—

M. antirrhiniflora. A purple-flowered species that blooms in summer. From Mexico.

M. Barclayana. Has blue and white flowers, produced in summer. From Mexico.

M. semperflorens. Flowers purple; a summer bloomer. From Mexico.

INSECTS.—Red spider is very troublesome on these plants, if not kept continually syringed through the growing season;

aphides will also live on them, for which fumigate.

MEDINILLA.

Medinillas rank among the finest of evergreen stove shrubs, alike handsome in foliage and flowers. The latter are arranged in gracefully-drooping panicles, unlike anything else to which they can be compared, and the plants themselves are among the freest of free growers. They may be cultivated with success even by those who have not had much experience in plant growing; still, although deserving of general cultivation where sufficient room exists in which to grow them, they are hardly suitable for small houses, for, though their natural free disposition to flower is such that they will bloom in a small state, the grand appearance possessed by a fully-developed specimen cannot be realised in the shape of a small plant. Being indigenous to hot countries, it is useless attempting the cultivation of Medinillas where a sufficiently high temperature cannot be maintained. To have full justice done to them, they require a good light house, where the growth, as it is formed, is of such a character as to promote the natural free development of flowers; for although they need a process of ripening the wood by means of dry treatment in autumn, this will not bring out the full disposition to flower to the extent that results from the growth being made under the gradual solidifying process effected in a house under a maximum amount of light. Another great advantage arising from their being cultivated under the conditions here recommended is that the wood produced is short jointed and the foliage comparatively small, a state that admits of the plants when in flower being much more profusely clothed with bloom than they otherwise would be.

Cuttings taken off in April, or as soon as young growth is produced and half ripened, strike readily inserted singly in 3-inch or 4-inch pots half filled with finely-sifted sandy soil, the upper portion all sand; they must be kept moist and covered, but not too closely, with a bell-glass. Cuttings thus put in in a night temperature of 70°, and proportionately higher in the daytime, will root in three weeks or a month; then gradually tilt the glasses and ultimately dispense with them altogether, inuring the plants by degrees to the ordinary atmosphere of the house. By the time they have made one pair of young leaves they will require more root-room, and should have their points pinched out to cause them to break. Medinillas are free-rooting subjects, and will bear moving into pots 4 inches or 5 inches larger than those they are in at this shift. They will succeed in either peat or loam, but we prefer the latter, though in it the foliage will not possess quite so much of the generally prized dark green tint that it will acquire in peat. This is, however, counterbalanced by the habit being made more sturdy and close. Through the summer they will bear as high a temperature as most stove plants receive—say 70° at night, and from 80° to 90° by day during sunny weather; syringe them freely at the time of closing the house in the afternoon, and give plenty of water at the roots. In very bright weather they will require a thin shade for a few hours during the middle of the day, but on no account should they be subjected to the darkening process which stove plants, collectively, have often to withstand. An impression sometimes prevails that it is necessary to keep out a portion of the light; whereas all that is wanted is simply to break the sun's rays. Medinillas should, therefore, always be placed at that end of the stove wherein are located such plants as require the least shading. The natural habit of Medinillas is such as to need but little support; a stick to the centre shoot and one to each of the side branches will be sufficient. The shoots will very likely again require stopping at the end of July or beginning of August. It is necessary to attend to this in the first stages of the plant's existence, so as to secure a sufficient number of shoots near the base. By the end of August shading should be dispensed with altogether. In the following month give more air and cease syringing overhead, which will gradually induce a state of rest. A night temperature of 60° through the winter will answer with a little more warmth during the day, and just sufficient water at the root to keep the soil from getting too dry. By the end of February the temperature should be raised 5° at night and 8° or 10° by day, with sun-heat. Commence syringing again as soon as the plants exhibit signs of growth, when they may be potted; a 6-inch or 8-inch shift will not be too much if they are plentifully supplied with roots, and this time the loam may be used in a more lumpy state than hitherto. Put plenty of crocks in the bottom of the pots and secure them well from soil getting amongst them, as these plants, with their large amount of leaf-surface, require a copious supply of water during the growing season. Owing to the natural disposition which the branches have to ramify, there will be no further necessity for stopping, except in the case of any shoots that are taking the lead too much. Raise the temperature as solar heat increases, and keep the plants up near the glass, and in syringing see that the water regularly reaches the whole of both the upper and under surface of the leaves. Shade as before during the brightest portion of the day, and give the necessary support by sticks and ties to the branches, without which sometimes the weight of water in syringing will cause them to split off. Treat as in the preceding summer, dispensing with shade and syringing, as the sun's power begins to wane, and give less air.

Winter as before, giving no more water at the root than is requisite to keep the leaves plump. This dry condition of the soil is necessary to the free production of flowers, but it must not be carried so far as to cause the leaves to flag, or they will fall off prematurely. Again raise the temperature in spring, when the first efforts will be directed to the formation of flowers, which will make their appearance at the points of the branches. Whilst these are in course of development too much atmospheric moisture should be avoided, and it is not advisable to syringe them overhead, as any excess in this way frequently leads to the blooms falling off before they expand. The flowers will last for two or three weeks, during which time they have a grand appearance. After blooming any strong growths may be cut back, and as soon as shoot growth commences another shift of 2 inches or 3 inches should be given, getting away some of the old soil from the upper portion of the ball as far as it can be done without disturbance of the roots. Treat them generally as recommended during the preceding summer, giving manure-water once a week; their winter management should also be the same as before. It frequently happens that plants in the second and subsequent years of flowering bloom more profusely than during the first, as, in addition to the bunches at the points of the shoots, quantities of flowers are often emitted from the hard wood of the branches or main stem, in which state they have a most singular, yet beautiful appearance. Medinillas may be retained for years, so as to occupy a moderate space, by having their branches shortened freely after flowering, and in potting shaking out a portion of the old soil and replacing with new material, supplying the requirements of the roots by the liberal use of manure-water in place of giving them inconveniently large pots.

M. amabilis is a native of Java, and may be said to be almost an exact counterpart of the following better-known kind, except that the panicles are borne perfectly erect instead of pendulous. Though thus nearly alike, the contrast between the plants when in flower side by side is most remarkable, each enhancing the beauty of the other.

M. magnifica, a native of Java, is a magnificent species. Its leaves measure from 10 inches to 12 inches long, and 7 inches or 8 inches broad. The flowers, which are produced in large, drooping, branching panicles, are of a rosy-pink colour, and the unopened buds are of the same shade, and are almost as handsome in the advancing stages as when expanded.

M. Sieboldii, from Moulmein, is a handsome plant, but inferior to both the above. It has rosy-white flowers.

INSECTS.—All the species of Medinilla are somewhat liable to the attacks of red spider, unless the syringing recommended in their cultivation is regularly attended to. Mealy bug and brown scale will also live upon them; for these, sponging the leaves and a strong application of insecticide in the case of old plants that, in cutting back, have been denuded of their foliage, will be found the most effectual remedy.

METROSIDEROS.

These are evergreen greenhouse shrubs, naturally somewhat straggling in growth, and are most suitable for a large house, such as a winter garden where there is room to accommodate a large collection of plants; but, where space is limited, they are not sufficiently attractive to deserve a place.

The method of propagation and after treatment is similar to that advised for Myrtles, which see.

M. ciliata. Flowers crimson; a summer bloomer. From New Caledonia.

M. floribunda. Bright crimson flowers, borne in whorls towards the extremities of the shoots. New Zealand.

M. florida. Has scarlet flowers, produced in summer. A native of New Zealand.

MEYENIA ERECTA.

There are two forms of this stove Acanthad, one bearing purple flowers with a yellow throat, the other white, but not differing in other respects either in appearance or in matters of cultivation. They are erect evergreen shrubs that attain a small or medium size; they are very nearly allied to Thunbergias, and the flowers of both are much alike. They are easily grown, and among the freest of free bloomers, flowering in succession from every shoot that is made. Blooming as they do in a small state, these Meyenias are suitable for growing by those who are not able to accommodate larger plants. Cuttings made of small bits of the young shoots strike freely; if these are put in about the middle of April they will root in three or four weeks if kept close, moist, and shaded; when well rooted move them singly into 3-inch pots. They will grow in either peat or loam; if the latter is used, mix with it a little leaf-mould, adding sand according to the nature of the loam; give them a temperature of 65° in the night with more during the day, regulated by the heat out of doors. Do not over-water, as these plants, through free growers, are a little delicate at the roots. Give shade or not, as needed by the state of the weather. Stop the shoots to promote the growth of side branches, and give 7-inch or 8-inch pots as soon as those the plants already occupy are filled with roots. As growth extends a few sticks may be required for support. A little manure-water will be of use after they have got well hold of the soil. Syringe freely overhead daily throughout the summer, regulating the amount of air by the outside temperature.

Towards August they may be expected to bloom, after which they will keep on until the approach of autumn renders a reduction of heat necessary. Give less water through the winter, during which time a temperature of 55° or 60° will suffice. They may be cut in before starting to grow in spring; then again keep them warmer, and, as soon as they have broken, repot, giving them 2 inches or 3 inches more room. This second summer, if manure-water is regularly supplied, they will not require another shift, and will bloom all through the season after midsummer. The plants may, if required, be kept on another year or be discarded, and their place filled by younger stock. These Meyenias come from Fernando Po.

INSECTS.—These plants are somewhat liable to red spider, but the nature of their foliage is such that the regular syringing they should have daily through the growing season will be sufficient to keep this insect down, and also aphides, which are likewise sometimes troublesome.

MICROLEPIA.

This genus of Ferns consists of stove and greenhouse species, and is closely allied to Davallias. It contains a few kinds worth growing.

For propagation and cultivation, see Ferns, general details of culture.

STOVE SPECIES.

M. hirta cristata. South Sea Islands.
M. platyphylla. East Indies.

GREENHOUSE SPECIES.

M. anthriscifolia. South Africa.
M. scabra. Nepaul.

MIKANIA.

Evergreen greenhouse twiners, with pretty flowers, but not much grown, or equal to many things that will succeed under the same conditions. They are increased by shoot cuttings in spring, struck in the usual way, and grown on in a mixture of peat and loam, in a little extra warmth, until they are big enough to plant out where they are to remain; or they can be transferred to good-sized pots, with the shoots kept trained over the space to be occupied.

M. scandens. Has white flowers, produced in summer. From North America.

M. suaveolens. Also has white flowers that appear in summer. A native of South America.

INSECTS.—Red spider and thrips are sometimes troublesome; fumigate for the latter, and syringe to keep the spider in check.

MIMOSA PROSTRATA.

Most of the species of Mimosa require more warmth than a greenhouse affords, but there is one, M. prostrata, that may be used as a roof climber in a cool house, in which way its elegant foliage is seen to advantage.

It is an evergreen plant, and can be increased by shoot cuttings in spring in the usual way, kept close, moist, and shaded in a temperature of 70°; afterwards they can grown on in a moderate stove heat until they have got well established; afterwards they will thrive in the temperature of a greenhouse, with such treatment as ordinarily given to the occupants of a cool house. The young plants should not be stopped, but encouraged to grow with a single stem, which should be trained to the rafter intended to be occupied; more root-room should be given as required.

INSECTS.—Syringe freely through the spring and summer to keep down red spider. Aphides are sometimes troublesome on this Mimosa, and are best got rid of by fumigation.

MIRBELIA.

A small genus of evergreen greenhouse shrubs that bear pretty flowers. They were much more in favour with cultivators in times past than at present.

They can be struck from shoot cuttings, and grown on under conditions such as advised for Coleonemas, which see.

M. Baxterii. Has yellow flowers, which open in spring. A native of New Holland.

M. floribunda. Flowers purple, produced in spring. From the Swan River.

M. pungens. Yellow flowers; a summer bloomer. Introduced from New Holland.

MITRARIA COCCINEA.

This is a dense-growing evergreen greenhouse plant that produces freely its handsome mitre-shaped scarlet flowers during the summer and autumn. It was introduced about the middle of the present century from San Carl de Chiloe, and is another of the number of handsome things comparatively neglected. It is more remarkable for the length of time it continues to produce a succession of flower than for opening them simultaneously, as in the case of most plants the blooming of which is of shorter duration; for this reason it is more suitable for general decorative purposes than for exhibiting. It is of comparatively easy growth, and succeeds well in moderately close peat, containing a fair amount of fibre, with a good sprinkling of sand added. It is a tolerably quick grower when well managed, soon acquiring a useful size and flowering freely in even a small state.

This Mitraria strikes freely from cuttings of the young shoots, such as will be available about May from plants that have been cut back early in the spring. Put them an inch apart in moderate-sized pots; kept moist, close, and shaded in a stove temperature they will root in a few weeks, when remove the propagating glasses, but keep a moderately moist atmosphere, and give a little shade. About the beginning of July move them singly into 3-inch pots, stopping the shoots, after which encourage growth by keeping the material on which they stand moist; syringe overhead in the afternoons when the house is shut up. After September comes in cease syringing and shading, and give more air. Keep through the winter at 45° in the night, and in March put them in 6-inch pots; after they have begun to grow in the new soil admit more air than in the preceding season, syringe overhead daily, and keep the material on which they stand damp, with a little shade in bright weather; again stop the shoots when a little growth has been made. Encourage growth during the summer as before, and in autumn assist them to get the wood ripened by the admission of more air and by a drier atmosphere; winter as in the preceding, and in March move into pots 3 inches larger than those they have hitherto occupied. This is a strong-rooted plant, and will bear the soil used in a moderately lumpy state; mix the sand well with it previous to use. Put an inch of crocks for drainage, and ram the soil pretty firm. Cut back the shoots to a uniform length of 6 or 8 inches from where they were last stopped to, and tie them well out. The wood is of a somewhat weak character, and consequently will require a moderate number of sticks for support. Be sparing of water until the roots are at work in the new soil, and keep the atmosphere a little close till the young growth begins to push, after which admit more air in the early part of day. As the weather gets warm close the house with sun-heat, and damp overhead with the syringe, at the same time keep the material on which they stand moist. Shade will not now be required, as in its larger stages, the plant will bear any amount of sun.

As already stated, it is a free-flowerer, producing its blooms from the current season's shoots, yet this season's growth will rather be to get the plants on in size than to produce flowers; consequently, about midsummer all the strongest should be again stopped, so as to cause them to break back. Continue to keep the branches well tied out, and also to use the syringe until the middle of August, when give more air night and day, so as to ripen up the growth, at the same time discontinue syringing and maintain a drier atmosphere; keep on this treatment through the autumn, merely guarding against too low a temperature on cold nights. Through the winter about 40° in the night should be kept up, and no more water given at the roots than is necessary to preserve the soil in a healthy condition. Again about the end of March repot, giving a 3-inch shift, in soil similar to that which was advised the preceding season, stopping and tying-out the shoots as before. Let the treatment during the spring be in every way as recommended last year. By the end of July they will most likely begin to show flower; as soon as the blooms make their appearance discontinue the use of the syringe, and give plenty of air and light. When the bloom commences to open, the plants, if required, may be placed in the conservatory, where they will keep on flowering for many weeks; after which they can be removed to the greenhouse, and wintered as previously. It will be advisable at this time to go over them and shorten their shoots back, as this will be better done now, when the plants have attained some size, than in the spring as heretofore. Give them another shift about the time advised the preceding seasons; they should again have pots 3 inches larger, and be treated in every way as hitherto recommended as to potting, syringing overhead, and water at the roots; by the time of flowering they will have got to a useful size, and be found attractive.

This Mitraria, from the free but somewhat weak habit of the shoots, requires cutting back after flowering to within 6 or 8 inches of the point whence the previous season's growth has commenced. Fourteen or 15 inch pots are large enough to grow even the largest plants in, as after they get into that size they may be kept in a free healthy condition by the use of manure-water during the growing season.

INSECTS.—The plant is sometimes affected with red spider, but if the syringing advised whilst in active growth is attended to, it will be kept in check. Should black thrips make its appearance fumigate with tobacco, or syringe freely overhead with tobacco-water.

MOHRIA THURIFRAGA.

A distinct-looking greenhouse Fern, with pretty habit of growth. From the Mascaren Islands. For propagation and cultivation, see Ferns, general details of culture.

MONOCHÆTUM.

Pretty, free-flowering, evergreen, warm greenhouse plants, that can be grown up from cuttings in a single season to a blooming condition.

They strike readily from shoot cuttings in spring, treated in their early stages in the way advised for Linums (which see), except that peat should be used in place of loam, and that the Monochætums, not being so much subject to red spider, do not require more syringing overhead than is needful to promote growth. They flower in the autumn.

The following are worth growing:—

M. ensiferum. Flowers pink. From Oaxaca.

M. Humboldtii. Rose colour. A native of the Caraccas.

M. Lemonianum. Reddish-purple.

M. sericeum multiflorum. Mauve.

MURALTIA.

A genus of dwarf-growing evergreen greenhouse shrubs. They are nearly allied to Polygalas, but the flowers are smaller, and they are not equal to the above-named plants for decorative use.

Their propagation and after treatment are such as advised for Polygalas, which see.

M. filiformis (syn.: Polygala filiformis). Flowers purple, produced in summer and autumn. From the Cape of Good Hope.

M. Heisteria (syn.: Polygala Heisteria). A purple-flowered species that usually blooms in winter. A native of the Cape of Good Hope.

P. humilis (syn.: Polygala humilis). This also bears purple flowers in summer. It comes from the Cape of Good Hope.

MUSA.

The Musas may be classed among the most stately and distinct of all fine-leaved stove plants. They are quick growers, and always effective where sufficient room can be given to allow of their large leaves attaining their full dimensions; and where there is not space enough to admit of this, their cultivation should not be attempted. In addition to their attractive appearance, valuable fruits are produced by at least two of the genus. They are free and quick growers and readily propagated from suckers, which the plants when strong produce freely; if these are separated with some roots from the old plants and at once put in pots that will admit them, with a moderate quantity of soil, and placed in a temperature of from 65° to 70°, they will grow away without delay. Good fresh loam with a little sand answers for them, and if some bone-dust is added, all the better. If the suckers are put in as above advised early in the spring, they will make rapid growth, and very soon require larger pots if they are to be grown in pots; this, for ordinary decorative purposes, is the most convenient way, as it admits of the plants being moved about where required, but if cultivated with a view to the production of fruit, such as borne by M. Cavendishii, they will succeed much better planted out where their roots will have more space. In this case, however, their treatment in other respects need not be in any way different from that required when grown in pots or large tubs. Increase the heat as the sun gets more power. They will bear through the summer as high a temperature as most plants in cultivation, with plenty of water

Musa Cavendishii *To face page* 252

to the roots, a liberal admission of air in the daytime, and a free syringing overhead in the afternoon; no more shade is required than is found necessary to prevent the leaves scorching. By the beginning of July they will most likely want another shift, which should be into pots or tubs from 18 to 24 inches diameter, according to the progress that has been made or the size they are wanted to be grown to, using soil of a turfy nature in good-sized pieces. They will now grow fast and require nothing more than ordinary attention, as already detailed. During the winter they should be kept in a temperature of not less than 60° in the night. With care to prevent their large massive leaves from getting disfigured they will keep in good condition for another summer, during which time they not only are commanding objects in the house in which they are grown, but are very effective when stood in large halls, vestibules, or similar places where they can be allowed to remain for a short time in summer. They are quickly grown up to an effective size, for which reason it is well to keep up a stock of young plants raised from suckers, as advised. By the use of manure-water they will do with less root-room.

The undermentioned are the best for general cultivation:—

M. Cavendishii. This is much the best where fruit-bearing is the object, as it does not grow to an unmanageable height—5 feet or 6 feet—and produces massive bunches of singular-looking fruit. When planted out it can be had in bearing from suckers in the course of twelve or fifteen months. A native of China.

M. coccinea. This also is a Chinese species, and is an ornamental plant of moderate growth and handsome appearance.

M. Ensete attains a considerable size, with a tall Palm-like stem and very large leaves. Introduced from Abyssinia.

M. sapientum vittata. A handsome species from St. Thomas, that attains a medium height.

INSECTS.—Musas are liable to the attacks of most of the insects that affect stove plants, yet their comparatively few, but very large and smooth, leaves afford little shelter for them. All except scale can easily be got rid of by syringing with tepid water. If scale appears it can be removed by sponging.

MUSSÆNDA FRONDOSA.

This singular, yet beautiful, plant belongs to a somewhat restricted family of evergreen stove shrubs mostly from hot countries, in both the Old and New Worlds. This species is much the handsomest of the genus, and is unlike any other plant in cultivation. It produces bright yellow flowers, borne in bunches, in form not unlike the well-known Pentas carnea, but individually smaller; yet it is not in the flowers alone that its beauty consists, but also in the large floral bracts or pair of floral leaves, pure white, that are produced immediately at the base of each bunch of bloom. In size and shape they are similar to the ordinary leaves borne by the plant, but do not much outlast the flowers, which will remain three weeks in perfection. The plant is easily managed, and does not require a great deal of room, a large specimen rarely attaining more than from two feet to two and a half feet in diameter. Its disposition to bloom is remarkably free, as even small examples consisting of a shoot or two will flower. The singular combination in colour produced by the pale green of the leaves and the white bracts, which, on a well-grown example, cover half the surface, and the bright yellow flowers rising immediately above them, is at once beautiful and wholly distinct from everything else—so much so as to create surprise that the plant is not more generally cultivated, either by those whose heated glass accommodation is limited, for which the little room it occupies adapts it, or by those who have large stoves or warm conservatories, where a few moderate-sized examples dotted about would offer a complete contrast to the other occupants.

It is as readily struck as a Pelargonium; cuttings made of the green, half-ripened shoots taken off with about three joints, removing the bottom pair of leaves, will root in a few weeks, inserted singly in small pots, drained and filled with a mixture of half-sifted loam, to which an equal quantity of sand has been added, and a thin layer of sand spread on the surface. They should be covered with a bell-glass, kept moist and slightly shaded with or without bottom heat, in a night temperature of 65° or 70° and proportionately higher in the day. This heat there will be no difficulty in maintaining about the time (April) when cuttings in the condition above described will be obtainable. As soon as they are found to have formed roots give air, gradually dispensing with the glasses, so as to inure the plants to the air of the house. When they have made two pairs more leaves pinch out the points of the shoots to induce the lower eyes to break, for although the plant is naturally inclined to assume a bushy form, yet to produce specimens that will branch out and hide the surface of the pots (in which way this and subjects of similar habits always look best), it is necessary to stop the young plants in their first stages. Directly they have again fairly broken into growth they will have made roots enough to require a shift; pots 2 inches or 3 inches larger will be big enough; drain sufficiently. It will succeed in either peat or loam, but we prefer the latter, as in it the growth is more robust, and the plant is able when in flower during the summer to bear removal to a lower temperature than that in which it has been grown, a condition that we have invariably found existing to a greater extent in loam-grown, heat-requiring plants than in such as are cultivated in peat. The loam should be of a good ordinary description, containing a fair amount of turfy matter not broken too fine, and with enough sand added to admit of the water passing quickly through it. Pot moderately firm and keep the plants where they will be exposed to the full light, with a slight shade in the middle of the day.

This Mussænda being found in the hot parts of India requires a brisk heat to grow freely. Admit a moderate quantity of air during the middle of the day, shut up so as to enclose a considerable amount of sun-heat, syringe overhead, and at the same time maintain a genial atmosphere. It must never be allowed to want for water in the soil, for, although it is not a delicate-rooted subject, and a hard condition is assumed by the old wood, the young shoots are always comparatively soft, and allowing it to flag through an insufficiency of moisture has a stunting effect, which limits the growth and in the same proportion its ability to flower. As growth progresses, tie the shoots to neat sticks inserted just within the rims of the pots, and again pinch out the points about the end of July; then shift into pots 3 inches larger, after which time continue to treat as before until the beginning of September, when dispense with the shading, and by the end of the month cease syringing, giving more air so as to gradually bring about a state of rest, to still further induce which reduce the temperature. Keep through the winter at about 60° in the night, with a little more by day, and give just as much water as will maintain the soil in a semi-moist condition. As soon as growth has fairly commenced shift into pots 2 inches larger, using enough sticks to keep the shoots evenly balanced, and again commence syringing overhead. The points must not now be pinched out, as it would delay the flowering; give proportionately more heat as the days lengthen, with a little shade when the sun is powerful. Towards the end of April the plants will show bloom; this will be indicated by the appearance of the white bracts, which will go on developing until the flowers expand. If kept in the stove they will bloom a second time towards the end of summer; consequently we should not advise their being moved at this first flowering to cooler quarters. When done blooming do not shorten the shoots, but simply pick off the decayed bracts and flowers, and at the same time give the plants a good syringing. They will now bear as much heat as is given to the generality of stove plants, and will recommence growth immediately. When two or three pairs of leaves have been made, they will again show flowers, which may be expected to arrive at maturity by the latter end of summer, at which time they can be moved to the warmest part of the conservatory; but while here, like most other stove subjects, they should not be placed where they will be under the influence of external air admitted directly in contact with them. When they are in cooler quarters give no more water than is sufficient to keep them from flagging. After the blooming is over shorten the shoots back to about one-half the length that has been made during the season, and at once return the plants to the stove, where they will again break into growth, although not much progress will be made till spring. Winter as before, and give a 2-inch or 3-inch shift as soon as the plants are fairly in motion in spring. Treat as in the previous season. When the first flowering is over they will be considerably benefited by the application of manure-water once a week. Let the autumn and winter management be similar to that previously advised, and when the time for potting in spring comes, shake out a portion of the old soil, replace with new, and return the plants to the same pots, which will be large enough for all ordinary purposes. As soon as the roots have got fairly hold of the new material, supply manure-water regularly through the growing season, by which means the plants may be kept for years in a healthy condition, a portion of the old soil being replaced by new each spring.

INSECTS.—Most of those which attack stove plants will live on this Mussænda, although they do not appear so partial to it as some things. The leaves are somewhat thin in texture, and are soon injured by red spider, but if in the syringing advised the water is got well to the undersides of the leaves they will never gain a footing. Thrips and greenfly are thus in like manner held in check, but should they make their appearance, fumigate or dip in tobacco-water. Brown scale and mealy bug where present must during the growing season be removed by brushing and sponging, and when the plants are cut in after the second flowering, they should be dipped in or well syringed with a moderately strong solution of insecticide.

MUTISIA.

Pretty evergreen climbing plants suitable for training to a supporting pillar or rafter of a greenhouse. Being less vigorous in growth than some climbing species they are adapted for situations where plants of rampant habit would not be admissible.

They strike from cuttings made of the young shoots in spring, treated in the usual way, inserted in sand, kept close, moist, and shaded from the sun in a temperature of 70°; when rooted move singly into 3-inch pots in a mixture of peat and loam, to which add some sand. Keep on in a growing temperature something like that in which the cuttings were struck until they have got established, when reduce it to an intermediate heat day and night, which maintain through the summer; give air in the day, and as soon as they begin to grow commence syringing freely overhead in the afternoons. About midsummer put the plants into 6 or 7 inch pots, and stop the points of the shoots. Place a stick for support to each, and keep them trained so that they do not get entangled. Admit more air as the season advances, and shade no more than needful until the end of August, after which discontinue it altogether, and reduce the temperature so as to bring about a state of rest. Keep through the winter at about 45°; we have found these plants to do better when kept during the winter a little warmer than most occupants of the greenhouse absolutely require. In spring move into pots 3 or 4 inches larger, in soil such as before, and place the plants so that the shoots can be trained over the space they are to occupy; attend regularly to this matter through the season as they progress in growth. If to be planted out, the bed they are to occupy should be prepared so that they can be turned out of the pots into it about midsummer, so as to allow time for the roots to make some progress before winter. One of the principal things to be attended to with these climbers is to syringe freely all through the growing season to keep down insects—without this the leaves get an unhealthy appearance; and to be equally careful that the roots receive enough water. Where the plants are kept in pots, all that is further required is to shift them on to larger ones as more root-room becomes needful, and when turned out to remove a portion of the top soil each spring. Whichever method is followed, as the plants get older give manure-water in the growing season, and each year after the flowering is over reduce the growth so far as seems necessary.

The undermentioned two are best worth growing:—

M. Clematis. Flowers orange and red; blooms in summer. A native of Bogota.

M. decurrens. Has scarlet and yellow flowers that open in summer. South America.

INSECTS.—The use of the syringe already advised will keep down red spider, and generally aphides as well, but if these are troublesome fumigate. For scale and mealy bug sponge and syringe with insecticide.

MYRSIPHYLLUM (MEDEOLA) ASPARAGOIDES.

A slender growing stove twiner with small, pretty, bright green leaves. The twining shoots, almost as thin as threads, grow to a length of many feet during a season, and are unequalled for decorative use in vases or baskets of cut flowers, or in the endless ways in which green drapery is now so effectively employed. The shoots are so thin as to be almost imperceptible, which, combined with their flexibility and the smallness of the leaves, adapts it for use where anything that was not extremely light in appearance could not be employed.

It can be struck from cuttings in spring in heat in the usual way, potted on in peaty soil, keeping the plants in a moderate stove heat, with a little shade in very bright weather; 6-inch pots will be large enough for the first year, and a tall stick should be put to each for the shoots to twine round. A winter temperature of 60° in the night will be high enough. In spring give pots 3 or 4 inches larger, and treat as before, affording the necessary support to the shoots as they extend, and managing generally as in the preceding summer. Large pots will ultimately be required as the plants get bigger, for the amount of shoots annually available for cutting will necessarily be proportionate to the size and strength acquired. It is best to turn the plants out in a bed where they will spread and yearly make a large amount of growth, which can be trained to strings taken up and attached to the roof, from which the shoots can be cut as required. Propagation may also be effected by division of the roots, which should be carried out in spring, just before growth commences; treat afterwards as recommended for the cutting-raised stock.

INSECTS.—Aphides and thrips will both live on the plants, but if due attention is given to daily syringing through the growing season this is generally sufficient to keep them under; when troublesome fumigation will effect a riddance.

MYRTUS (MYRTLE)

These pretty, old-fashioned plants are not now held in such estimation as in times past before the introduction of such numbers of greenhouse species bearing showy flowers,—which latter have done much to banish many kinds of sterling merit, such as the Myrtles. These, in addition to their beautiful glossy foliage and pretty white flowers, have an agreeable perfume, and possess the merit, if fairly attended to, of keeping in healthy condition for an indefinite number of years—in this respect vying with the Orange, which is proverbial for its lengthened existence under cultivation.

Myrtles are easily struck from cuttings of the three-parts ripened shoots, which should be taken off with a heel towards the latter end of summer, when the growth is in right condition; the cuttings should be put several together in 5 or 6 inch pots, filled with sand, kept moist and shaded in a cool pit or greenhouse until they are callused over at the base, after which stand them in a temperature of 60° where they will make roots. They should then be moved singly into small pots and be kept through the winter where the heat in the night will be about 50°, here they will go on moving slowly. As soon as top growth has made a little progress pinch out the points of the shoots, and about the middle of March move into 4-inch pots; they will grow in either peat or loam, but we prefer the latter where of good quality, sand being added as required. Give a little more warmth both day and night until the latter end of May, when artificial heat will not be needed. Again pinch out the points of the shoots, stand the plants on a moist bottom near the glass, and give a moderate amount of air in the day, with a little shade in bright weather; syringe overhead at the time of shutting off the air, and apply water to the soil as needed. Continue to treat in this way through the summer, by the end of which they should be nice-sized bushy plants. A winter temperature of from 35° to 40° will suffice, as anything short of frost will do no harm, and the plants are better for not making any growth through the winter. In spring give larger pots, regulating the size according to the strength of the variety grown—the miniature Jenny Reichenbach (a desirable kind on account of the shoots being so useful for mixing in bouquets, where those of the larger sorts are not always admissible) does not need pots near so large as the stronger varieties. The subsequent treatment required is of a routine character, simply following the course so far advised as to light, air, water, and the use of the syringe until the end of June, after which the plants are better out-of-doors where they will get a little shade in the middle of the day; so managed they will ripen their growth and set flowers so as to give them a pretty appearance when in bloom, which will be in the spring, early or late, according to the temperature they are kept in.

The following are desirable kinds:—

M. communis angustifolia.
M. communis Jenny Reichenbach.
M. communis latifolia.
M. communis latifolia plena.

All have white flowers, and are natives of Southern Europe.

INSECTS.—The regular use of the syringe advised will keep down most insects, but should scale get on them it must be removed by sponging and washing with insecticide in the winter when the growth is matured.

NELUMBIUM.

These are beautiful aquatic plants, requiring similar treatment to Nymphæas, which see, except that they must have the water a good depth; their flower-stems, unlike the Nymphæas, rise high out above the water, and there is this further difference that, when at rest, they may be allowed to get into a semi-dry condition.

N. luteum. A pretty yellow-flowered plant that blooms in summer. It comes from Carolina, and will thrive in a warm greenhouse.

N. speciosum. A beautiful species known as the Sacred Bean. The flowers are pale pink in colour, and highly fragrant. It is found in India and adjacent warm countries.

NEPENTHES.

(Pitcher Plants.)

When first the handsomely marked

Bornean species of these singular stove plants became sufficiently plentiful to be procurable, many people who had the convenience of a stove attempted their cultivation, but in most cases with indifferent success, no doubt through comparatively little being known of the course of treatment that they require. A knowledge of the temperature and humidity of the atmosphere whence they came was enough to point conclusively to the fact that without the means of, at all times in the year, being able to accommodate them with as much heat as most hot-region plants require, it is of little use attempting to grow them, as though they may be kept alive with less than this, they will never acquire the strength necessary to produce their curious pitcher-like leaves in the manner required—and without these there is little interest attached to them. Another and frequent cause of the plants forming pitchers but very sparingly, even when they grew in other ways freely, was either too much shading, or what amounts to much the same thing, a position too far from the glass. For with only one exception, and that N. lanata, among all we have grown, we have found that if their heads are kept within a few inches of the glass they succeed best, having a strength and vigour in both root and top growth not attainable by any other means; and, as might naturally be supposed, the pitchers acquire a higher degree of colour when kept up close to the roof. Another matter of more importance with these plants than any others in cultivation, is never to injure the roots in potting, for if this should occur to an extent that would scarcely have any perceptible effect upon most things, it will in all probability cause their death, or bring about a condition little better than actual loss. We may here remark, for the benefit of those who have not had any experience at all with them, that their roots are so fragile and dead looking, even when the plants are in every way healthy, that we have known them all pulled off under the impression that they were dead. They are very spare rooters, needing much less room than most things, and when repotting becomes requisite, there must be no attempt at shaking any of the old soil away. Consequently from the first it is necessary that the material they are grown in should be such as is least likely to get into a decomposed state, for when it is close and soapy the roots cannot live in it, and from the large amount of water they always want it is liable to become sour—when in active growth they need watering freely every day, and during the winter must be kept much more moist than the generality of plants. Even under the most successful course of treatment, there will be a space of four or five years from the time a young plant is first well rooted until it arrives at a size that will exhibit the full development of which it is capable; for, not until it has been twice headed back, and has again got furnished with from four to six shoots, each bearing their full complement of pitchers, has all that is desirable been attained. Consequently it will be easily understood that the best and most lasting material that it is possible to find wherein to grow the plants will eventually get so completely decomposed through the necessity of its being kept all but saturated with water, that it becomes like soft putty, in which condition the roots cannot exist; and, as already stated, they are so brittle that the old material cannot be got away in the ordinary manner, but this can be effected by means of a pailful of tepid water in which the ball should be plunged with both hands under it, and the exhausted matter got away by carefully moving the fingers. With a little time and patience in this way the roots can be wholly preserved in a perfectly clean state ready for transferring to a fresh pot with new soil; but on no account should there be any attempt at opening them out, as this will most likely end in their being much injured. The best kinds, such as N. sanguinea, N. Rafflesiana, and N. lanata, are more tender-rooted than the commoner species. About the end of February or March is the most suitable time in the year for either shifting on into larger pots those young and medium-sized plants that want more root-room or for washing out, as above described, any older examples that need entirely new material. Pots proportionately so large as would be required for the generality of plants would not do for Nepenthes, as if too great a body of soil is present it gets sour directly. The largest specimens we ever had were grown in pots not more than 10 or 12 inches in diameter. The manner these plants are often allowed to run up straggling to a considerable height on a rafter or pillar is not the way for seeing them to the most advantage, as when the shoots of the best sorts have attained 4 or 5 feet in height—with some much less than this—the pitchers assume a character which is understood amongst growers as run-out; that is, they come devoid of their wing-like appendages and are very different in form from those that are produced by the leaves on the stems before they get such a height. The best position for them is hung up to the ridge of a span-roofed house, standing ends north and south, with their shoots within 1 foot or so of the glass, lowering the pots as the tops advance, and giving a thin shade when the sun comes on them, but none at other times. If suspended alike up to the roof in a hip-roofed or lean-to structure facing south they will require a thicker shade in bright weather, but this will be easily seen, as if they get too much sun the leaves will assume a deep crimson colour instead of being green tinged or mottled with red, which latter is an evidence of the robust health essential to the full development of the pitchers that should be produced at the extremity of every leaf. When all the cultural conditions requisite for their well-being are present, even the leaves of N. Rafflesiana, and others of like habit, that are made slowly through the autumn and winter, will, in the spring, when more heat is present, open the small pitchers formed during the dull season. We have been particular in describing somewhat in detail the appearance and necessary condition of the roots of the plants, as also the position in the house they require to be grown in and their disposition to pitcher freely, for the presence of these in a large and highly coloured state is the certain test of the plants having all they want; in this condition, thus suspended where an opportunity exists of exhibiting to the full their most singular beauty and graceful habit, it will we think be admitted that there are none in the whole range of cultivated plants more generally interesting or more deserving of a place. The conditions necessary to grow Cucumbers well in the winter, viz., heat, humidity in the atmosphere, and very little direct admission of air, will be found such as to well suit Nepenthes; a night temperature at this season of 65° will answer, with a few degrees higher in the day, more or less proportionate with the state of the weather; at the same time most of them will bear as much heat as any plants in existence. The air of the house must never be allowed to get dry, and for some twelve weeks in winter they will need no shade or any air more than reaches them through the laps of the glass and other similar places of ingress. They should at this season be watered at the root every other day, and syringed overhead; through the spring and summer water at the root and syringe every day, keeping them as warm day and night as the means at command will permit. Through May, June, July, and August the night temperature should be 70°, with 10° or 15° higher by day, and never admit so much air, especially directly on the plants, as most things will beat; give shade as already spoken of. A warm moisture-laden atmosphere must always be present, and plenty of tepid water to the roots is indispensable to their healthy existence. This obviously renders an abundance of drainage in the pots necessary.

It is a healthy sign of improved taste in horticulture to see beauty and singularity of form being appreciated as much as colour alone. That this is so, is evident from the increased sale for such plants as Nepenthes, the cultivators of which through the kingdom at one time might be counted on the fingers, but which, to supply the demand, those who grow them for sale have now to propagate by thousands.

Nepenthes can be raised from cuttings made of pieces of the stems, such as available when the plants are headed back; these should consist of a couple of joints each of mature growth, with all, or a portion of the leaf retained to the upper joint. They root best when inserted in some open material such as a mixture of small crocks and sand; covered with a bell-glass in a bottom heat of 70° or 75°, kept close and moist, they will root in the course of two or three months. They will strike at any time of the year under the above conditions. When struck they must be placed in 3 or 4 inch pots, in a mixture of the best fibrous peat, potsherds, sand, and chopped sphagnum, and great care should be taken not to break the fragile young roots; keep them moderately close until they begin to grow. These pots will be large enough for the first year, and the spring following give them others 1 or 2 inches larger. All necessary in the subsequent stages of their growth is to give more root-room each spring as the plants get larger, cutting them back, when a height of 2½ feet or so has been reached, to 6 or 8 inches above the collar; this will generally cause them to break two or three shoots from near the base. Treat afterwards as already advised, giving a little more root-room when this seems requisite, and repeating the cutting back when the shoots have again attained a height of 2½ to 3 feet. It is from the growth made after this second heading in that the finest examples may be looked for, as now they will push enough shoots to produce quantities of pitchers. The plants will last many years, and can be kept in a healthy state by removing the old exhausted soil in the way already shown, as often as it appears to be approaching a soft pasty state. This operation is best carried out at the time the plants are headed down.

Nepenthes are oftener grown in baskets

than in pots, but, we prefer the latter, as in them the roots cannot protrude, and in this way get their extension stopped as they do when in baskets, with the result that the pitchers do not get so large. Where the appearance of pots hung up is objected to, they can be plunged in baskets filled with sphagnum.

The following is a selection of the best:—

N. ampullacea picta. A stout, small-growing species, with prettily spotted pitchers, produced not only singly from the extremities of the leaves, but in clusters from the stem.

N. bicalcarata. A singular species from Borneo. It has stout foliage bearing large pitchers, crimson in colour, winged, and furnished with two horn-like spurs.

N. Courtii. A very distinct and handsome dwarf hybrid variety, having large, deeply crimson spotted, flask-shaped pitchers.

N. distillatoria. A well-known stout-growing kind, that produces its long green pitchers freely.

N. Dominiana. A fine free-growing hybrid, with good-sized, handsome, highly-marked pitchers.

N. Hookeri. Nearly allied to N. Rafflesiana. A compact-growing, smaller-pitchered species, similarly marked.

N. hybrida maculata. A smallish grower, with rather long, cylindrical, deeply streaked or spotted pitchers with ciliated wings. There is one peculiarity in this kind—that is in the pitchers coming almost wholly green and devoid of colour when the shoots attain above a certain height.

N. lanata. A very stout-growing species possessing a remarkably pale yellowish-green shade; the pitchers, tinged with red, are large, long, and prominently furnished with hair-like appendages. This kind we have found does better hung a little further from the glass and shaded a little more than some of the others. In rarity it is similar to N. sanguinea.

N. Lawrenceana. A distinct small-pitchered hybrid variety, very pretty. The pitchers are profusely spotted with crimson.

N. Mastersiana. This is a splendid hybrid variety raised by crossing the Indian N. sanguinea with the Chinese N. distillatoria. It produces very large pitchers, the greater part of which are of a bright claret-red colour.

N. Morganiæ. A grand highly-coloured large-pitchered variety of American origin. It is a stout grower; the pitchers are flask-shaped, wings moderate in size, pale green mottled with red in their early stages, assuming as they get older almost a wholly red colour; the lid is entirely green.

N. Rafflesiana. Large handsome pitchers, flask-shaped and deeply spotted with dark brown, wings prominent and crested, the lid broad and ample. This, for its fine effect and general good qualities, has not yet been surpassed. We have had it with pitchers that held over a pint fairly measured.

N. Rajah. A wonderful kind. Leaves from 1 to 2 feet long; the pitchers on a fully-developed plant are nearly a foot long, by half as much in diameter. It is a Bornean species, said to grow naturally at a considerable elevation.

N. robusta. A distinct hybrid variety, with pitchers unusually wide at the base, heavily spotted with reddish brown.

N. sanguinea. A very stout-growing, long and large-pitchered species, with intense sanguine colour in the upper portion of the pitchers; the wings are narrow; the lid erect and small. Very scarce and high-priced, and likely to remain so.

N. Sedenii. A very pretty small-growing hybrid, with long pitchers, dilated at the base and thickly spotted with red.

N. Stewartii. A free-growing variety, with pretty highly-coloured pitchers, thickly spotted and clouded with crimson. A hybrid.

N. Williamsii. Compact in habit. Pitchers of medium size, and very highly coloured; the bright red spotting is most profuse, often covering the greater portion of their surface. Also a hybrid.

INSECTS.—So far as insects go, the continuous use of the syringe keeps down all but brown scale, which, if it happens to get upon them, must be got rid of by sponging with clean water. They are too soft in texture for the use of any insecticide to be safe.

NEPHRODIUM.

This is a genus of moderate-sized stove and greenhouse Ferns, of which N. molle, and its crested forms are perhaps the best known.

For propagation and cultivation, see Ferns, general details of culture.

STOVE SPECIES.

N. denticulatum.
N. lucidum. Madagascar.
N. pubescens.
N. villosum.

GREENHOUSE SPECIES.

N. molle. South America

N. molle confluens.
N. molle corymbiferum.

NEPHROLEPIS.

A genus of Ferns containing stove and greenhouse species, several of them being splendid plants, remarkable for their elegant arched fronds; they are worthy of a place in every collection.

For propagation and cultivation, see Ferns, general details of culture.

STOVE SPECIES.

N. acuta.
N. pluma. Madagascar.

GREENHOUSE SPECIES.

N. davallioides. East Indies.
N. davallioides furcans. South Sea Islands.
N. exaltata. Tropical America.
N. pectinata. Tropical America.

NERINE.

In these we have a genus of greenhouse bulbous plants that produce freely their splendid flowers; N. sarniensis (the Guernsey Lily) is the best known, although it, in common with others of this beautiful genus, is now much neglected. Some of the kinds produce leaves before flowering, others push the bloom previous to the leaves. To be successful with them the principal matters to be kept in sight are to give due attention to the full development of their flowers by plenty of water, and a free use of the syringe to keep the foliage clear of insects and healthy, until leaf-growth is completed, and afterwards to get them thoroughly ripened; the best way to effect this is to remove them from the house or pit in which the growth has been made to the foot of a south wall in the open air exposed to the full sun where the roasting they get is of the greatest use.

They are increased by offsets, which should be taken off before the growing season commences, and put three or four together in 5 or 6 inch pots, according to the size the offsets are; good holding loam with a little sand suits them. Pot firm, and as soon as they show signs of growth give water, and stand them close to the glass where they will get all the light and sun possible; encourage growth by syringing overhead daily until the leaves have attained their full size, and admit plenty of air. An ordinary greenhouse, still exposed to the full light, will answer for them through the winter, and when the leaves begin to show signs of decay withhold water; through the spring still let them have all the sun and light possible, but keep cool. When they begin to grow again soak the soil well with water, and if more room seems necessary give pots a size larger, but do not over-pot, as these plants do not like too much room. Treat onwards through the period of growth as advised for the previous season in every way, again keeping them dry when at rest. A repetition of the treatment thus far advised through the growing season, and subsequent rest, is all that is necessary, as the plants arrive at a flowering condition. Afterwards when the pots get too full and more room must be given, the mass of bulbs when larger than desired may be divided before the growing season begins.

The following are all beautiful kinds:—

N. corusca. Scarlet.
N. corusca major. Scarlet.
N. elegans. Pink.
N. elegans carminata. Cerise.
N. elegans cœrulea. Shaded blue.
N. Fothergilli. Scarlet.
N. Fothergilli major. Scarlet and yellow.
N. humilis angustifolia. Rose.
N. Plantii. Crimson.
N. pudica. White.
N. rosea. Rose.
N. sarniensis. Rose.
N. venusta. Crimson.

Some of these are hybrids bearing splendid flowers; the species come from the Cape of Good Hope, China, and Japan. They flower during the advanced summer and autumn months.

INSECTS.—Red spider and aphides are the principal insects that affect these plants, syringe freely while the leaves are fresh for the former; for aphides fumigate.

NERIUM.

(Oleander.)

This species is an evergreen greenhouse plant, and was introduced from Southern Europe; there are now several varieties of it, varying little except in colour. The plants are of easy culture, and will bear indifferent treatment and neglect that would cause the death of most things. It is in this neglected condition that they are too often met with, yet it must not be supposed that under such usage anything approaching the success that is possible with a better system, can be attained. It frequently happens with these and some other plants of great excellence that will exist with the worst treatment, that an estimate of their merits is taken under the disadvantages of indifferent culture; hence

NEPHROLEPIS EXALTATA. *To face page*

PANCRATIUM AMŒNUM. *(See page* 265.*)*

the fact of the place they deserve being occupied by inferior subjects. The individual flowers are not unlike those of a small Carnation, and are produced in large bunches on the points of the mature growth. Neriums are plants of very easy culture, growing freely in almost any kind of soil, either loam or peat; in the latter their handsome shining leaves attain a larger size and deeper hue; in loam, the disposition to make growth is not so great, which is rather an advantage, as they flower more freely. There is one thing that especially commends them to the notice of those who require decorative flowering plants in quantities: that they can either be grown into large specimens or be managed so as to bloom in a small state. Nothing in the way of flowering plants in 6 or 7 inch pots can be more beautiful than are these Neriums when well grown, in which state they can be used for conservatory decoration, or in any place where there happens to be so little light as would cause death or serious injury to most things.

The propagation of Neriums is as easy as their after growth. About the end of March take off the points of the shoots, consisting of three joints or so, remove the leaves from the lowest one and trim the base at the joint; put the cuttings singly in 3-inch pots filled with half loam and sand, with a little sand on the top, stand in a moderate heat, keep close and moist, with a little shade when necessary. They will root in a few weeks, when gradually inure to more air, and after they are fairly established give still more, and pinch out the points. By June move them into 6 or 7 inch pots, using soil similar to that in which they were struck, but containing less sand; as soon as they have begun to root freely in the new soil they will do best with ordinary greenhouse treatment, giving plenty of water to the roots, and syringing through the summer daily. In autumn admit more air and keep the soil drier; winter at about 45° in the night, and when the object is to grow them on into large specimens they should, about the middle of March, be moved into pots 4 inches larger than those they have occupied. As they are not impatient of having their roots interfered with they should be gently loosened and spread out a little in the new soil, which ought to consist of good fibrous loam, broken not too fine, to which has been added a moderate quantity of sand. Use the potting lath, so as to make the soil solid, place the plants where they can be kept a little close, and syringe overhead every afternoon, closing the house early enough to cause the temperature to rise considerably. They require a plentiful supply of water when growing, and must not be allowed to become dry—they will need even immediately after potting a good deal more than most things, and when the roots have fairly commenced growth they want over double the quantity requisite for many hardwooded plants. If the shoots have made 8 or 9 inches of growth beyond where they have previously been stopped back to, they should at the time of potting have their points again pinched. Encourage growth as much as possible, and as the shoots extend in length use a few sticks to keep them open, but no support will be needed, as the growth is strong enough to do without it.

Neriums are particularly light-loving plants, consequently no shade must be given. Syringe freely every afternoon; by the middle of July they will have made considerable growth, and should be turned out-of-doors in the full light, with a piece of mat or canvas round the pots to ward off the force of the sun, which will otherwise have an injurious effect upon the roots that will now lie thickly against the inner surface of the pots; supply them plentifully with water, and continue the use of the syringe.

About the beginning of September the growth will be well ripened, and the flower-heads be about forming. They should now be taken indoors, and kept through the autumn and winter in a temperature of from 40° to 45° in the night; they should be given much less water, but do not allow the soil to become too dry, or the bloom-buds that are formed will be in danger of falling off. If the plants are wanted in flower earlier than they will come in by the influence of solar heat, they may, about the middle of March, be placed in a night temperature of 55°, with 8° or 10° of a rise in the daytime—this will considerably hasten their blooming, but too much heat and moisture must not be used, or it will cause the buds to fall off. After flowering, put them in pots 4 inches larger, and encourage growth in the same way as the preceding season; they will not require stopping, as they will make a number of shoots from the base of where the flowers were produced; again expose them to the full sun in the open air. Keep through the winter as previously; in the spring after blooming they will in all probability be getting taller than required. If such is the case, cut the strongest shoots well back, give them another shift, and encourage growth as before, submitting them to open-air treatment in the latter part of the summer. After the next spring flowering, if getting larger than needful, they can be headed down, and as soon as a little growth has been made a good portion of the old soil may be shaken from the roots, and the plants replaced in the same pots, in new; afterwards grow them on as before, and by the liberal use of manure-water they may be kept going for a couple of years without repotting, when younger stock can be grown on to supply their place.

Where Neriums are required for flowering in a small state the best method is to keep a large plant or two, grow them on each season, and then ripen up in the open air as above recommended; when the flowers show on the points of the shoots cut these off about 8 inches in length, and strike them singly in 6-inch pots, using soil similar to that advised for growing them in; put them in a gentle bottom-heat, and keep the tops as cool as possible, give plenty of water and a little shade. So treated they will quickly form an abundance of roots, when they may gradually be inured to a greenhouse temperature, in which let them remain through the winter; in spring they can, as wanted, be either allowed to come into flower slowly or brought on in a little warmth, as recommended for the larger plants, after which they may be potted and grown on as required.

The following are all well worth a place:—

N. album. White.
N. splendens. Reddish pink.
N. variegatum. Striped.

INSECTS.—Should aphides or thrips make their appearance, fumigate with tobacco; the syringing recommended is generally sufficient to keep them free from red spider; if they get affected with scale it can be removed with sponge and brush.

NICOTIANA AFFINIS.

A pretty white-flowered greenhouse plant, that keeps on blooming for a length of time, through the summer and autumn. It is nearly allied to the tobacco of commerce, but quite different in appearance; it is much like a single form of Petunia, the tube of the flowers being much longer. It is raised from seeds, sown, and treated afterwards in every way as recommended for Petunias, which see.

NIDULARIUM.

These are small-growing stove plants, belonging to the order of Bromeliads. They are very compact growers, in general appearance much like the Tillandsias and Æchmeas, to which they are nearly allied. The flowers are produced similarly from the crown or centre of the plant; those of several of the species are very singular in appearance, nestling in a close, compact mass, like the head of a Cauliflower before it opens. The flowers are preceded by a number of small, brilliantly coloured leaves. The plants are easily grown, provided they receive a sufficient amount of heat, with a moist atmosphere and a little shade. They are increased from suckers produced like others of the Bromeliaceous family. These should be taken off from the parent plants after being allowed to remain attached until they have got sufficient strength—in fact, it is better not to separate them before they have grown to near the full size, as growth is much quicker while supported by the old crowns. The roots are of a tough, wiry nature; good fibrous peat, such as suitable for Orchids, will answer for them, adding a sprinkling of broken crocks or charcoal; 4-inch or 5-inch pots are large enough at first, and the suckers should be kept moist after they are severed from the parent plants. If separated in the spring they will get established sooner; give them a corner of the stove away from any current of air, with a temperature of about 65° or 70° in the night through the summer. They do best in a fairly light position, but should be shaded from the sun when it is powerful; syringe them overhead daily, and always allow the water that collects in the hollow crown to remain. They will not require any more pot-room during the first summer; 60° by night will answer through the winter, and they should never be allowed to get dry at the roots.

In the spring when the heat is again increased give them pots a size larger, using soil similar to the first; if they gain sufficient strength, the plants will flower towards the end of summer, but, unless the suckers were strong when taken off, they may require another season's growth before blooming. The tuft of coloured leaves and the flowers which follow collectively retain their colour for many weeks, and have an extremely pretty and distinct appearance. After blooming treat in every way as before, so as to encourage the production of suckers, retaining the old stools after the first are removed, as they will generally make a second growth; this is the more necessary, as these Nidulariums increase slowly.

N. cyaneum. This species has comparatively large leaves, 20 inches long, green ground colour spotted with brown, under surface banded with greyish white; flowers reddish violet with deep red bracts. Brazil.

N. fulgens. A compact-growing kind, outer leaves deep green, inner ones red; violet-coloured flowers. Brazil.

N. Innocentii. Outer leaves stout and broad, dark dull green above, red beneath; centre leaves orange colour; flowers white. Brazil.

N. Laurentii. Leaves spotted dark brown on a green ground colour; flowers dull purple. From South America.

N. Meyendorffii. A strong-growing species with leaves larger than those of some of the family; spiny on the edges, inner leaves crimson; flowers bluish purple. Brazil.

N. Scheremetieurii. This is a larger grower than some of the genus, attaining a diameter of 18 inches or 20 inches; inner leaves bright red; flowers purple and white. Brazil.

N. spectabile. Has stout recurved leaves, reddish purple at the tips with greyish white bands on the under side. Flowers violet, produced in a dense mass. A native of Brazil.

INSECTS.—The texture of the leaves of Nidulariums is so hard, that they do not afford food for many insects, but both brown and white scale will live on them, and sponging is the best remedy.

NOTHOCLÆNA.

A pretty genus of Ferns, comprising both stove and greenhouse species. They are principally small growers, in appearance much like the Cheilanthes, to which they are nearly allied.

For propagation and cultivation, see Ferns, general details of culture.

STOVE SPECIES.

N. crysophylla.
N. lanuginosa. Madeira.
N. nivea. Tropical America.
N. rufa. Tropical America.
N. tenera. Mendoza.
N. tomentosa. Mexico.

GREENHOUSE SPECIES.

N. Ecklonïana. South Africa.
N. Marantæ. Southern Europe.

NYMPHÆA.

A magnificent genus of aquatic plants, most of which require a stove temperature. To do justice to them, and admit of enough kinds being grown to give variety, they should have a large tank with the water heated. The beauty of their flowers, combined with the length of time some of them keep on blooming (the hybrid N. Devoniensis, for instance, flowers for six months in succession) renders them extremely desirable plants. Their cultivation is simple, provided, as already said, there is a tank sufficiently large to accommodate them. Some of the smaller species may with considerable success be grown in a large tub, placed in a warm part of the stove where there is plenty of light.

They are increased by seeds or portions of the roots, the latter will in most cases be found the most convenient plan—cut the thick fleshy root-stock in good-sized pieces in the winter or early spring, before growth is made. Large wide pots should be used, and plunged in the tank, but yet raised sufficiently from the bottom to allow the leaves to rise somewhat above the crowns of the plants. Good yellow loam answers for them. Through the growing season the water should be kept regularly at 80°, or a few degrees over, and the temperature of the house ought to be such as required by the warm section of stove plants; in winter it should not be lower than 55° for the warm species. Enough water should be regularly admitted to keep the whole sweet and clear, as if stagnant it soon becomes offensive.

N. blanda. A white-flowered species from Trinidad.

N. cærulea. A small-growing, blue-flowered species, that flowers in summer. Introduced from Egypt.

N. cyanea. Bears blue flowers in summer. From India.

N. devoniensis. A splendid kind, with deep rosy-crimson flowers. A garden hybrid.

N. Lotus. A moderate-sized, white-flowered species, one of the most continuous bloomers. From Egypt.

N. rosea. A strong-growing, large-flowered, rose-coloured kind, from East India.

N. rubra. This is one of the finest species, bearing large crimson blooms. It comes from India.

The following will grow in a lower temperature, but in other respects require treating similarly to the warm species:—

N. dentata. Bears white flowers of large size, and in large numbers. From Sierra Leone.

N. scutifolia. A beautiful blue-flowered species, from the Cape of Good Hope.

ŒNOCARPUS.

In these we have a genus of stove Palms, chiefly noticeable on account of the oil that some of the kinds yield, and which is used in several ways. They are mostly tall growers, with thin straight stems that bear good-sized pinnate leaves.

For propagation and cultivation, see Palms, general details of culture.

Œ. Batava. A stately species that attains a considerable height, but which may be kept within reasonable bounds for some time under pot culture. A native of South America.

Œ. dealbatus. A species that attains a moderate size, and is distinct-looking when it has advanced beyond the early stages of growth. From the Amazon country.

Œ. frigidus. A free-growing species that forms a handsome head of leaves. Tropical America.

OREOPANAX.

A genus of evergreen, ornamental-leaved plants nearly allied to the Aralias, in appearance not unlike A. Sieboldii. They do the best in an intermediate temperature; in other matters treat as advised for stove Aralias, which see.

O. dactylifolium. A handsome, large-leaved plant, with palmate, deeply-lobed leaves. Introduced from Mexico.

O. plantanifolium. A pretty kind, with general habit somewhat like O. dactylifolium. From Peru.

INSECTS.—The juices of these plants are little suited to the tastes of insects, but thrips sometimes affect them, for which sponge and syringe freely.

OTHONNA CRASSIFOLIA.

An evergreen plant, from the Cape of Good Hope, with scandent habit. It is of no particular merit, but is sometimes used as a greenhouse climber. It can be increased by cuttings in spring in the usual way, and grown on in a pot until it is large enough for planting out.

The flowers are yellow, produced in autumn.

INSECTS.—Nothing interferes much with this plant except red spider or aphides; should the former be troublesome syringe freely; for aphides fumigate.

OUVIRANDRA.

Among the most singular of all vegetable productions are the Ouvirandras or Lattice Plants. They are stove aquatics whose leaves float near the top of the water in which they grow, but not quite on the surface. The water should not be very deep, for the plants are not large growers—the leaves of a healthy, well-grown specimen rarely attain a length of more than 12 or 15 inches, and are borne on foot-stalks not nearly so long as the leaf-blade. Coming as they do from Madagascar, a country proverbial for its high temperature, it follows that under cultivation Lattice Plants must be continuously in water kept at something approaching a uniform temperature. Another matter of importance is that the water should be clean and without sediment, otherwise the deposit left on the leaves would not only spoil their appearance, but also cause them to decay prematurely.

These Ouvirandras can be increased by division of the crowns, but we much prefer seedlings, which are produced freely from self-sown seeds wherever the plants are grown well, and have sufficient room. They can, however, be induced to grow freely in a moderate space, such as a tub 3 feet or so in diameter and 2 feet deep. In the bottom of this should be put a mound of loam about 6 or 8 inches deep and a foot in diameter; in this the young plant should be placed and the soil just pressed around it, the surface of the mound being left quite smooth; then fill up with water at a temperature of 80°, introducing it very gently, so as not to displace the soil. The vessel thus furnished should be set over, or as close as possible to, the hot-water pipes, so that the water in which the plant is immersed may be kept at an even temperature; this is best secured by growing it in something that will hold a considerable body of water, such as a slate or lead cistern about 3 feet square; in that case the plant can be put in a pot, and the pot placed on another inverted in the tank, and then the leaves will not be too deep in the water. Some fresh water at a temperature of 80° should be added three or four times a week, so as to cause a moderate portion to run over; in this way the water will be regularly renewed, and kept in a fresh, clear condition.

Little further is required, except that if the water, notwithstanding the precaution suggested, happens to get foul, it should be completely changed, and the leaves very carefully sponged, so as to remove all slimy matter from them. These plants, however, rarely do well if the water cannot be kept clean without entire renewal. We have spoken of Ouvirandras as requiring the water kept in a continuously warm state. This cannot well be done except in a house in which a high temperature is maintained, and unless such is at command it is of little use attempting their cultivation. Where the plants have plenty of room they grow to a large size, forming a number of crowns with some dozens of leaves, in which case they usually flower, and the seeds vegetate readily. There are two kinds — O. Berneriana and O. fenestralis; the leaves of O. Berneriana are blunter than those of O. fenestralis, and the former is by some thought to be the best grower.

OXYLOBIUM.

Dwarf evergreen greenhouse shrubs of bushy habit that bloom freely, but are inferior to many hardwooded plants now in cultivation. They require similar treatment to Polygalas, which see.

The undermentioned are the best kinds.

O. capitatum. Flowers yellow; a summer bloomer. Swan River.

O. ellipticum. Yellow, also a summer bloomer. Van Dieman's Land.

O. Osbornii. Has yellow flowers produced in summer. From Australia.

O. Pultenææ. Deep orange; blooms in spring. New Holland.

PANAX FRUTICOSUM.

A pretty evergreen stove plant, with alternate, bipinnate, drooping leaves, toothed on the edge. It is suitable for use in any way where fine-leaved plants of moderate size are required. It will thrive under ordinary stove treatment, such as answers for other inhabitants of warm countries. It comes from Java.

PANCRATIUM.

These constitute a somewhat numerous family of bulbous plants, the greatest portion of which are stove species; nearly all of them have white and generally highly fragrant flowers, which, for beauty and elegance, have few equals. They are found indigenous over a wide range of mostly warm countries, extending from South America, the West Indian Islands, to eastern continental India. With few exceptions they require a warm house to grow in; consequently, the remarks following on their cultivation will refer to such kinds as do the most satisfactorily with stove heat. Like most bulbs, they succeed best in a close, somewhat strong loamy soil, made firm in the pots. They can be raised from seed sown as soon as it is ripe, which will generally be in the autumn, in pans of sifted loam with a little sand added; press the material firmly down, scatter the seeds thinly on it, and cover them slightly, after which stand the pans in a temperature of 60°, and shade so as to keep the soil from getting dried and requiring more water than should be given before the seeds vegetate. As soon as the young plants have made their appearance give them more light. Keep them in a temperature such as that just advised until the solar heat increases, when it may be increased proportionately, and air given daily and water when needed; they will not require much, if any, shade. As soon as they have got large enough to handle they should be pricked out 2 inches apart in soil similar to that in which the seeds were sown, pressing it quite firm. They will through the summer and autumn bear an ordinary stove temperature, which should be reduced proportionately in winter. In spring put them singly in 3-inch pots, making the soil quite solid and draining the pots well. They will require nothing further during the summer and ensuing winter, except treatment as to heat, air, and water as in the previous season.

In spring they will again want more room. The largest will take 7-inch pots; for the weaker plants those an inch less will be big enough. Treat in every way as in the past season. By autumn some of the strongest may be large enough to flower, but nothing will be gained by attempting to hurry them to this; it is far better to let them have another season's growth before blooming, as they will then flower so much stronger. Move them in spring into 9 or 10 inch pots, and treat liberally in all respects so as to get the bulbs as large as possible; in the autumn gradually withhold water, letting the soil get as dry as the plants will bear without injury. They will stand keeping in a semi-dry state through the winter. In the spring, when the temperature is increased and water given, they will again commence growing, and the strongest may be expected to bloom during the summer. All that is further required is to treat generally as so far advised, giving larger pots as the plants seem to require it, but these, in common with most other bulbous subjects, do best with no more disturbance of their roots than can be avoided. With fair usage the bulbs will go on increasing in size and will make offsets, which can be taken off and treated as recommended for the young bulbs raised from seed, the difference being that the offsets can be induced to bloom in less time than seedling plants.

The undermentioned are a few of the most desirable kinds:—

P. fragrans. A very free-flowering, handsome species, the most generally cultivated of any. It comes from the West Indies.

P. rotatum is from Carolina, and is a smaller grower than some others of the family.

P. speciosum. Another West Indian plant, a stronger grower than the preceding. It usually blooms later in the summer than P. fragrans.

P. zeylanicum. A very handsome kind of medium growth from Ceylon.

The above are all white-flowered sorts, and will generally be found to be sufficient, except in the case of those who form collections of these plants.

INSECTS.—The smaller species of insects, such as thrips and aphides, that affect stove plants will live upon Pancratiums. These can be destroyed by fumigating with tobacco. Scale and mealy bug where present are the most troublesome, as they get down into the axils of the leaves, from whence they can only be removed by sponging or the use of a soft brush.

PANDANUS.

The Pandanus or Screw Pines, so called from the screw-like form in which their leaves spring from the main stem, are remarkable for their elegantly curved leaves which reflex with a regularity that gives them in either a large or small state, when well grown, an interesting appearance. In colour some are deep green with a reddish brown shade on their toothed edges and sharply spined midrib, as in P. utilis or P. elegantissimus, or beautifully variegated with white, as in P. Veitchii, or P. javanicus. They are mostly strong growers, but several of the species attain a much larger size than the rest. The majority of them come from the hot parts of the eastern hemisphere, and consequently like a high temperature.

They are increased from suckers which most of the species produce more or less freely from the main stem; if these are taken off in the spring, a few of their bottom leaves removed, placed singly in small pots filled with a mixture of half loam and sand, and stood in a brisk bottom heat, such as would do for suckers of the edible Pines, they will soon emit roots. When well rooted it is better to stand the plants close to the glass where they will get a full volume of light, for upon the leaves not becoming at all drawn depends the appearance of the plants as they get larger. The green-leaved kinds require only as much shade as will keep their leaves from getting injured; the variegated ones want more shading, or the white portions assume an ugly greenish yellow colour. As the sun approaches its full power the heat should be increased to 70° in the night, with 10° or 15° more in the day when it is bright, giving air daily when the weather will permit, and syringing the plants overhead in the afternoons. By the beginning of June larger pots will be required; the size of these must be regulated in accordance with the difference in the kinds cultivated, the most room being given to the strongest growers. Drain the pots well; they will succeed in either peat or loam, but we prefer the latter, as it usually favours more robust growth as well as higher colour in the variegated sorts. If more root-room is wanted before the end of summer it must be given, they are free-rooting plants, but yet it is not well to give them larger pots than necessary. Reduce the temperature in the autumn, and discontinue shading; 60° or 65° in the night will be enough through the winter, with 5° or 10° more in the day; at the same time keep the soil drier. In the spring again increase the warmth both day and night, and treat generally as advised the preceding season, giving additional pot-room as it becomes necessary. All that is required further is to follow on with the treatment advised up to this point, giving larger pots from time to time as the roots fill those they already occupy. When the specimens get old and the lower leaves fall off, or become shabby, the heads may be cut away, which will cause the stems to break out, the young suckers from which can be taken off and treated as advised, after which the old stools can be discarded, as young plants are preferable.

The undermentioned are a few of the best and most distinct:—

P. elegantissimus. A free-growing kind from the Mauritius, with handsome foliage that ultimately attains a considerable size.

P. graminifolius. A very handsome small-growing kind; one of the most elegant in habit and suitable for growing where the larger sorts are not.

P. javanicus variegatus. Is handsomely variegated and particularly pretty while young.

P. reflexus. A strong grower that attains a very large size; the reflexing of its leaves gives it a distinct appearance. A native of the East Indies.

P. utilis. A very strong-growing, handsome species from Bourbon. Suitable for cultivating in a big house where its large spreading leaves will have room.

P. Vandermeerschii. This also is a desirable sort that attains a medium size.

P. Veitchii. A beautifully variegated

species, very handsome in either a large or small state. From the South Sea Islands.

INSECTS.—The hard texture of the leaves of these plants does not offer much attraction to insects generally, which are easily kept under by syringing. If scale affects them, sponging must be resorted to.

PAPYRUS.

These are handsome evergreen plants, best suited with a moderate stove temperature, although they will live in a greenhouse. They are aquatics, suitable for growing in a tank of a house devoted to water plants, but will thrive well in pots if kept stood in water.

They can be raised from seeds and also by division of the crowns, which latter will usually be more convenient. The propagation by this means should be carried out in spring before growth begins; turn the plants out of the pots, shake away the soil, and then with a knife separate the crowns, which place singly in pots large enough to accommodate the roots and allow for the season's growth. Ordinary loam answers for them. As soon as potted give water and stand the pots in the stove in pans of water kept regularly filled. The usual stove treatment, with a daily use of the syringe is all they require, and larger pot should be given as needed proportionate to the size the plants are wanted to be grown to.

P. antiquorum. The Egyptian paper plant. A handsome species that forms large heads of singular drooping leaves A native of Egypt.

P. syriacus. A fine kind, very effective when well grown.

INSECTS.—Few insects affect these plants when properly attended to with water and frequent syringing; through the growing season aphides sometimes give trouble, for these fumigate.

PASSIFLORA.

(Stove.)

Passifloras constitute a large family of evergreen climbers, mostly of strong growth, especially such as are strictly stove species, which are here treated of. Many of them are only adapted for comparatively large structures; if introduced to small houses it becomes necessary to use the knife to such an extent that little of their true habit and disposition to flower is possible, while, on the other hand, if allowed to ramble so as to exhibit their natural character they all but smother everything else, and, however desirable it may be to see such plants developed to their full extent, few people will care to give up a whole house or division in a range almost entirely to a single plant or two. Where, however, there is sufficient room they rank amongst the grandest of climbing or twining plants. Their cultivation is very easy, as they are generally indifferent to the description of soil their roots are placed in, provided it is not too adhesive or too poor; in the former case, from the quantity of water required to develop and maintain their large amount of leaf surface, it would become sour and unkindly, and if too poor, the foliage always looks sickly, and is liable to be infested with insects, which are usually persistent in their attacks on plants not in a free condition of growth. But in avoiding this the opposite mistake must not be committed of using the soil in too rich a state, as in this case the plants grow so rampant as to be unmanageable; if a little manurial assistance becomes necessary it can be supplied in a liquid state. The Passion flowers are botanically nearly allied to the Tacsonias; the species here treated of require considerable heat, being natives of hot countries, such as the warmest parts of Mexico, Brazil, Jamaica, and other West Indian Islands. One of the finest—if not the very finest—of the group, P. quadrangularis, is from Jamaica; it has ample, deep green, handsome foliage, and very large beautiful flowers, singular like the rest of the family in their strange formation, as well as in the effect produced by their combination of blue, red, and green; in P. Buonapartea, sometimes grown under the name of the former species, the colour is red, blue, and white.

They strike readily from cuttings made of the young shoots taken off with a heel during the spring, when they have attained a length of 5 or 6 inches. Insert them singly in small pots drained and half filled with sandy peat, the remainder sand alone; keep them moist and confined under a bell-glass or in a propagating frame with or without bottom heat. They will root in the course of a few weeks, when the glass may be dispensed with; as soon as the small pots are moderately filled with roots, shift into larger ones. From their free habit of growth they will bear a larger shift than most things. Six or 7 inch pots will not be too big, placing a stick to support each plant. They will stand a strong heat when there is sufficient length of daylight to warrant its application; 70° in the night, with a proportionate rise by day, will not be too much, though they will grow, but comparatively slower, with less. Keep them well up to the glass where all the light possible will reach them, using a thin shade during the middle of the day, but not more than is found necessary to prevent the leaves scorching; give air daily more or less according to the state of the weather, syringe freely overhead at the time of closing the house, but not oftener even in the hottest weather, for when carried beyond this it is a practice which we may here allude to as highly injurious to all but a very few exceptionally moisture-requiring subjects; it excites undue growth at the expense of substance and solidity in both the leaves and shoots. The stopping of the single shoot, that each will so far be composed of, must needs be regulated by the purpose the plants are wanted for; if to cover an end wall or to occupy several rafters in the roof, it will be necessary to pinch out the point of the shoot once or more, so as to induce the production of several growths to fill the space required; but if to be grown, as these plants sometimes are, where space is limited, lengthways of the house, over a path where one or two branches are trained to wires as near the glass as the rafters will permit, they will only require stopping so far as to furnish the few growths needed. In this way they will flower freely, but have not so nice an appearance as when occupying a position where the blooming shoots can hang down in a looser manner. By the end of July another shift will be required; 10-inch pots by this time will not be over large, and as soon as the shoots have attained sufficient length the plants may be put in the position they are intended permanently to occupy.

If to be planted out, the border in which the roots are to be placed should not be too large, or it will be difficult to keep the plants within bounds. The bottom must be well drained, with the requisite egress below for the water to get away. This is a matter that frequently does not receive sufficient attention, from a supposition that the surplus water that soaks through the soil in the process of watering will find its way off; yet such is by no means the case, as after a time the under surface gets almost impervious to water, and the roots, which, with free-growing plants like these Passifloras, are produced in quantity, and lie thickly in the bottom of the pot, tub, or border in which they are grown, as a natural consequence, if stagnant water exists there, rot, causing the unhealthy condition the plants are often seen in. From 9 to 10 inches in depth of soil will be enough for the roots to ramble in; it should be moderately rich, and should contain enough sand to keep it quite porous. The shoots will require constant attention until they have filled the space they are destined to cover; keep them trained to the supporting wires, and take care that the lower portion is sufficiently clothed first, or it will be difficult to accomplish this afterwards without cutting the plants back, and beginning the work anew by inducing the production of a fresh lot of shoots to cover the space that, in the first instance, they should have been trained over. It should ever be borne in mind in the cultivation of these climbing plants, and of such as are of a twining habit, that they have the greatest disinclination to extend downwards, except in the case of the flowering terminal shoots, which often are found in a hanging position, but the strong growths made early in the season require, at the least, to be kept in a horizontal position, and do still better where they can ascend. So apparent is this that it may be noticed where a strong shoot happens to lose its hold of the support to which it was clinging, and thus hangs with its point downwards, that it makes little progress afterwards, generally breaking out another growth at the highest point where bent, leaving the pendant portion in a half starved, dwindling condition. Were more notice taken of the habit of climbing and twining plants, and their natural requirements in this respect kept before the eye of the cultivator, there would be much fewer failures with them. After the plants have filled the position allotted to them, little more training will be required than a regulation of the shoots, so as to prevent their getting entangled in masses, cutting in yearly after the season's growth and flowering are completed. When there is an apparent exhaustion of the soil, it will be best to meet this in two ways—by removing a few inches of the surface in spring before growth commences, replacing it with good new material, and also by the use of manure-water, which the plants will take in a somewhat stronger state than weaker-growing subjects; by these means they will keep on in a healthy condition for many years. When the roots of Passifloras are confined to pots or tubs, it is necessary that these should be large, and that as much of the surface soil as can be annually removed should be replaced with new, well enriched with rotten manure; this, with the help of manure-water given regularly through the growing season, will keep them in a thriving state for three or four years, when they may be headed back, and after they have broken into growth partially shaken out and the soil renewed. This will impart to them the requisite vigour to grow and bloom for a few more years, when the operation may be repeated or their places supplied by young plants, which, from their freedom to strike and grow, there is little difficulty in getting up to a large size in a short time.

The most suitable kinds for general cultivation are :—

P. alata. A handsome free-growing sort, with red and purple flowers. West Indies.

P. amabilis. A free-growing, handsome variety, from South America, bearing scarlet and white flowers.

P. Buonapartea. A strong-growing, large-leaved kind, with blue, white, and red flowers.

P. cardinalis. A very handsome kind, with bright effective flowers produced freely. Suitable for a large house.

P. Decaisneana. A fine free-growing kind.

P. kermesina. This is a handsome kind that branches freely, and produces its crimson flowers in abundance.

P. Loudonii. A moderate grower, bearing handsome purple flowers, produced freely.

P. princeps. A handsome, moderately vigorous kind with scarlet flowers. Brazil.

P. quadrangularis. A strong-growing kind with broad massive green leaves, and blue, green, and red flowers. Jamaica.

P. quadrangularis aucubæfolia. A variegated-leaved form of the above with handsomely-marked foliage.

INSECTS.—Passifloras are not more subject to insects than the generality of heat-requiring plants, but these parasites will live on them, especially mealy bug, which must be sought for at the base of the leaves and in the crevices of the bark on the mature stems and half-ripened shoots; also, the syringe can be freely employed, and will be a means of keeping them under, still further aided by strong washings with insecticide when the plants are at rest. Remove scale by sponging, and should thrips or red spider make their appearance, a free use of the syringe will be the best remedy.

PASSIFLORA.

(Greenhouse.)

Among these are some of the most beautiful and free-growing climbers, best adapted for a good-sized house.

Their propagation and cultivation is similar to that given for the stove species, except that, as a matter of course, they require less heat, and their growth is slower, taking a longer time to attain a size suitable for planting out.

The undermentioned are desirable kinds:

P. Campbellii. Red.

P. cæruleo-racemosa. Purple. A garden variety.

P. edulis. Blue and white. The fruit of this species, purple in colour, is edible. Brazil.

P. Imperatrice Eugenie. Violet, white, and lilac. Brazil.

P. onychina. Purple. Buenos Ayres.

P. palmata. Blue, purple, and white. Brazil.

P. sanguinea. Crimson, violet, and white. Columbia.

PAULLINIA.

Evergreen stove plants with elegant foliage, borne on slender shoots. They do not require much room, and on that account are preferable to many of the coarser-growing kinds of fine-leaved subjects.

They are increased by cuttings which require to be potted and grown on in the usual way with plenty of heat in summer, and should be kept proportionately warm in winter. They may be trained on sticks so as to form a loose bush, or look well suspended with the shoots hanging down.

P. oceanica. A beautiful species, with small leaves, borne alternately on dark coloured shoots. From the South Sea Islands.

P. thalictrifolia. A handsome kind, with small, pretty foliage. The shoots have a thin, wiry appearance, and require support. From Brazil.

INSECTS.—Most of the insects that affect stove plants are troublesome on the Paullinias; constant attention must be given them by syringing and sponging, if at all affected, or the foliage gets so far injured as to spoil their appearance.

PAVETTA.

Two species of these handsome plants well deserve a place in the stove, viz., P borbonica and P. caffra. Of these the first is one of the most beautiful of evergreen variegated stove subjects. It is a hard-wooded species, erect in habit, and incapable of being made to branch out until it has acquired considerable strength and height. Indeed, it looks best when confined to a single stem. The leaves are a foot or more in length, shining, bright green, distinctly marked with blackish green, and the midrib red. It may be propagated from eyes with a leaf attached, or from young side shoots such as spring from the main stem when the plant gets strong enough, or from shoots produced by a specimen that has been headed back. The cuttings should be put singly in small pots in a brisk bottom heat if available, kept close, moist, and shaded. They generally require a good length of time to form roots. When these are present in sufficient numbers move the young plants to larger pots, using good sandy peat, and keep them in a brisk heat. Supposing the cuttings to have been taken off in the spring, it will be August by the time they get fully established in their pots. Treat generally during the remainder of the summer as required by other evergreen warm stove plants, syringing daily overhead, with a moist atmosphere, and giving shade when the sun is powerful. A temperature of 65° will be enough for the winter. In spring give them 6 or 7 inch pots, increasing the heat as the days get longer; all further needed will be a continuance of the treatment given last summer, and a similar course when winter again comes round, with pot-room as the roots want it. The plants should be grown on so long as they retain their lower leaves, after the loss of which they lose much of their beauty, and ought to be shortened in, when the stools will produce cuttings. It comes from the Isle of Bourbon.

P. caffra makes growth in the way of Gardenia intermedia, and produces flowers in bunches like a small white Ixora; it is a free bloomer, its flowers look very pretty on the plant, and are well adapted for cutting. It strikes freely from cuttings of the young shoots put in about the end of April, at which time they may usually be had in suitable condition; place them singly in little pots, filled with sand; they will root in a month if kept warm, close, moist, and shaded. After the small pots are filled with roots move into others, 3 or 4 inches in diameter, using sandy peat; pinch out the points of the shoots, and grow on in a moderate stove heat, with a little shade and some air in the middle of the day, syringing in the afternoon. In August give them pots 2 or 3 inches larger, and encourage them to fill the soil before winter, during which time a temperature of 50° or 55° will be enough. More pot-room will be needed in spring, when the points of the leading shoots should be pinched out; treat as to warmth and other matters as in the preceding summer. The plant is a good grower, and the young stock will require larger pots before the growing season is over. If all has gone well most of the principal shoots will produce flowers during the early part of autumn, after which the points of the growths may be cut back slightly, and the plants wintered as before. Give more root-room in spring, and treat generally as advised for the preceding season's growth. By cutting in a little annually and partially removing the soil when needful, they will last for years. This Pavetta is a native of the Cape of Good Hope, but does best with more warmth than most plants from the same region require.

INSECTS.—The daily use of the syringe advised during the growing season will keep the smaller insects in check. Should scale or bug, both of which insects will thrive on them, attack the plants, syringe with insecticide when at rest, and sponge the leaves if growth is in progress.

PAVONIA.

Evergreen stove plants possessing comparatively little merit, yet somewhat singular in appearance. They are easily grown, requiring nothing more than ordinary stove treatment, with moderate heat through the growing season, and a temperature of about 60° in the night during winter. They will thrive in either peat or loam, with a liberal supply of water to the roots in summer.

P. Makoyana. A distinct-looking species, one of the best of the genus; flowers purple and bright carmine. From Brazil.

P. Wiotii. This species bears curious flowers, a combination of bright and blackish red. From Brazil.

PELARGONIUM.

Of all the genera of plants which are used for the decoration of greenhouses, there are none that hold a more prominent place than Pelargoniums. So accommodating are they that some of them will flower all the year round, while nearly all will produce flowers as long as they can be kept growing.

Their propagation is easily effected from either shoot or root cuttings, the former mostly being used. They will strike at any time of the year, but spring or the latter part of summer is the best; if the latter season is chosen the shoots will be in right condition about the end of July. Cuttings may be made of the tops, or of the lower part of the current season's growth, which will be further matured; in the latter case let the cuttings be composed of a couple of joints each. Put them 2 or 3 inches apart in pans or pots half filled with a mixture

Pelargonium Niphetos

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of half loam and sand, the remainder all sand; give a little water, but do not make the soil too wet. An ordinary frame, with plenty of air continually on, fully exposed in the open air at this season will answer. When well rooted put them singly in 3-inch pots, using good loam with some rotten dung and a little sand added; pot firm, pressing the soil well down. Keep rather close in a frame or house for a week, with a little water, but not so much as many things would bear. When top growth has fairly begun pinch out the points of the shoots, stand close to the glass with plenty of air in the daytime and no shade. Keep the soil drier through the autumn, and towards the end of the year move them into 5 or 6 inch pots, still keeping them as near the roof as possible in an airy house, with a little heat on cold nights, so as to keep the temperature about 45°. Pelargoniums will do with less warmth than this, but are better with it. Tie out the shoots horizontally close down to the rims of the pots; if this is not attended to while the growth is soft and pliable it cannot be done afterwards. Give much less water than most things require, and never apply it in the winter season until the soil is all but quite dry, for the roots of Pelargoniums are at all times less able to bear the soil in a wet state than almost any other plants; even in spring, when in full growth, care must be taken in this matter, particularly with the fancy varieties. If the plants are wanted to bloom early the shoots must not be stopped again, but if to flower later pinch out the points again when potted the second time. When the bloom buds are visible give weak manure-water once a week; shade from the sun when in flower. After blooming turn the plants out-of-doors for two or three weeks to ripen the shoots, giving little water, then head them down to within two or three eyes of the bottom, and stand them in a frame so that they may not get wet by heavy rains; apply no water to the soil except by syringing once a day. As soon as they have broke into growth shake away most of the old soil, and return the plants to the same pots with new. Keep them close for a week or two with little water to the soil, still sprinkling them overhead with the syringe in the afternoons. When the roots have had time to move, and shoot growth has made a little progress, give water. Treat afterwards as advised through the preceding autumn, and again about November give pots an inch or two larger; thus managed the plants will last many years. Eight-inch pots are big enough for Pelargoniums of any kind, however large or old they may be; by shaking out as advised after flowering the soil gets renewed, and by the use of manure-water in the height of the growing season they may be grown to a large size. The early blooming varieties of Pelargonium, with elegant frilled flowers, are now deservedly in favour; they bloom profusely through the late winter and early spring months, and also in the summer, if the shoots are stopped as already suggested. Their treatment is in no way different, except that for early flowering they must be kept warmer in the winter.

The Zonal varieties, double and single, are the best for autumn and winter blooming, for which purpose plants should be prepared by striking cuttings in spring, and growing them on with plenty of light and abundance of air through the summer, keeping them in the autumn and on during the winter as near the glass as can be in a temperature of 48° or 50°, with air on night and day. This section, as also the Nosegay varieties, are not so impatient of water as the kinds first treated of. The Bronze varieties will succeed with treatment in all respects similar to the Zonals.

The Tricolor section, both the silver and gold varieties, are slower growers than the kinds cultivated for their flowers, and should have less pot-room until they have gained size; their propagation and after treatment is such as recommended for the large-flowered and fancy kinds. The same applies to the Ivy-leaved varieties, which have been much improved of late, and are deserving of being extensively grown in hanging baskets, and for general decorative use.

The treatment detailed applies to all the sections of Pelargonium except the Cape species and their hybrids, which are best increased by root cuttings made of bits of the strong roots; they should be cut in lengths of about an inch and inserted in sand so as to just leave the top above the surface. They may be struck in spring standing them in a temperature of 55° or 60°, and keeping them slightly moist but not wet or too close; when they have made 2 or 3 inches of top growth, pot them singly, and treat subsequently as advised for the others. These Cape species are weak growers, and must have less pot-room than the other kinds.

The lemon-scented sorts of Pelargonium grown for their perfume, and their elegant Fern-like leaves, so well adapted for using amongst cut flowers, require to be treated in their several stages like the flowering varieties.

SHOW VARIETIES.

Achievement. Lilac-rose, centre white, maroon spot on top.

Ambassador. Pink, lower petals rosy pink.

Blue Bell. Purple, margin lilac, black blotch.

Charlemagne. Salmon-peach, top petals spotted.

Claribel. White, carmine spot on top petals.

Cornet. Orange-scarlet, maroon spot on top petals.

Corsair. Purple, top petals black, centre white.

Criterion. Lower petals crimson, narrow crimson margin.

Cromwell. Crimson, maroon spots, white centre.

Desdemona. White.

Duchess. Crimson lower petals, black top petals, centre white.

Duke of Connaught. Crimson-scarlet.

Fireball. Scarlet.

Illuminator. Vermillion-scarlet, white centre.

Lady of the Lake. Orange-rose, top petals crimson.

Lord Clyde. Scarlet, top petals maroon-blotched.

Mary Hoyle. Orange-rose, centre white.

Maid of Honour. Pink, centre white, maroon blotch on top petals.

Monarch. Crimson-purple, white centre, crimson edge.

Pericles. French white lower petals, top petals dark.

Pompey. Orange petals, white eye.

Purple gem. Deep purple, black-maroon top petals.

Queen of Scots. Orange top petals, lower ones rose.

Queen Victoria. Crimson, white centre.

Red Gauntlet. Bright scarlet, black spot on top petals.

Rob Roy. Violet rose, white centre.

Scottish Cheftain. Crimson and dark maroon.

Statesman. Rose and maroon, white centre.

Virgin Queen. Pure white, carmine spots.

Warrior. Crimson, black spots.

Decorative kinds, the best for early spring flowering :—

Chameleon. Deep scarlet, spotted.

Chimene. Crimson-red, dark blotch on all the petals.

Decorator. Crimson, maroon spots.

Defiance. Bright scarlet, centre violet.

Duchess of Bedford. White, carmine spot.

Duchess of Edinburgh. White, purple blotch.

Emilie Evrard. Bright scarlet.

Etna. Vivid scarlet, violet centre.

Improvement. Crimson, dark blotch.

Kingston Beauty. Pure white, purple blotch on top petals.

Lady Blanche. White, crimson spots.

Lucie Lemoine. Pure white.

Madame Thibaut. Light.

Maid of Kent. White, rose spots.

Monsieur Rouillard. Deep carmine, edged with white.

Mr. John Hayes. Rosy pink, white edges.

Mrs. John Hayes. Delicate peach, spotted.

Mrs. Lewis Lloyd. Velvety crimson, violet centre.

Mrs. William Davis. Pale pink, maroon blotches, and crimson spots.

Queen Victoria. Orange-carmine, white edges.

Scarlet Gem. Bright scarlet.

Venus. Pure white, carmine spots.

Virginale. White, crimson spots.

William Smith. Flesh colour, chocolate blotches.

FANCIES.

Acme. Purple maroon, white throat.

Bridesmaid. Lavender, white edge.

Brightness. Rosy crimson, white centre.

Cloth of Silver. White, rose blotch.

Delicatum. Light rose and white.

Fanny Gair. Rosy lake, centre and edges white.

Godfrey Turner. Crimson, lilac margin.

Indian Chief. Deep maroon, edges and centre white.

Jewess. Rosy carmine, bordered with lilac.

Lucy. Crimson, violet shading.

Madame Sainton-Dolby. Crimson, under petals mottled.

Miss-in-her-Teens. Upper petals cerise, under mottled crimson.

Neatness. Crimson-purple.

Placidum. Rosy purple, edges and centre white.

Roi des Fantasies. Crimson, centre white.

Silver Cloud. Pink, centre white.

The Shah. Crimson, centre light, edge lilac.

Thomas King. Carmine, centre white, edges lilac.

ZONALS.

Attraction. Lilac-pink ; double.

Clara Pfitzer. Rose-pink ; double.

Commander-in-Chief. Scarlet.

Corregio. Crimson.

Earl of Beaconsfield. Dark scarlet ; double.

Edith Pearson. Red, salmon tinted.

Fanny Catlin. Rosy-salmon, large white eye.

Gathorne Hardy. Orange-scarlet.

General Farre. Orange-salmon; double.

Henry Beurier. Salmon; double.

Heroine. Pure white; double.

Hermia. Rose red.

Horatius. Light magenta.

Ivanhoe. Red.

J. C. Musters. Crimson.

Jeanne d'Arc. White.

La France. Magenta-scarlet.

Lord E. Cecil. Cerise-scarlet; double.

M. Gelein Lowagie. Orange-scarlet; double.

Madame Colson. Deep salmon.

Madame Francois Desbois. Deep pink; double.

Madame Leon Dalloy. Blush white; double.

Madame Maurice Aubrey. Crimson; double.

Madame Vaucher. White.

Meteor Flag. Rosy-scarlet; double.

Monsieur Ed. Avenel. Pink, shaded purple.

Mr. H. Cannell. Scarlet; double.

Mrs. Cordon. Crimson, white eye.

Mrs. Daniels. Deep pink, white blotch on top petals.

Mrs. Patchitt. Deep rose.

President Leon Simon. Orange-scarlet; double.

President McMahon. Salmon and black.

Representant Baudin. Deep crimson; double.

Roi des Violets. Purple-violet; double.

Souvenir de Carpeux. Purple; double.

Spencer. Magenta.

Sunbeam. Scarlet.

The undermentioned Zonals will be found particularly adapted for blooming in winter and early spring:—

Euraka. White.

Henry Jacoby. Purple-crimson.

Madame Thibaut. Pink; double.

Master Christine. Bright pink.

Vesuvius. Scarlet.

Wonderful. Scarlet; double

NOSEGAYS.

Joyful. Magenta and orange.

Nemesis. Brilliant scarlet.

Samuel Plimsoll. Purple-crimson.

Titania. Bright salmon, streaked.

IVY-LEAF.

Anna Pfitzer. Rosy-pink; semi-double.

Aureum marginatum. Variegated leaves, yellow and green.

Beauté de Lyon. Purple-scarlet.

Diadem. Rosy-violet.

Duke of Edinburgh. Variegated, white and green.

Gloire d'Orleans. Crimson-magenta; double.

Innocence. Pure white, maroon stripes.

L'elegante. Variegated, white and green.

Madame Crousse. Rose, veined-maroon; semi-double.

Madame E. Galle. Pure white; double.

Mont Blanc. White, rose-tinted; double.

Mrs. George. Deep rose, purple shading.

Mrs. H. Cannell. Mauve-purple.

Peltatum elegans. Mauve.

Viscountess Cranbrook. White and rose; double.

GOLDEN TRICOLORS.

Baroness Burdett-Coutts.
Gem of Tricolors.
John Downie.
Last of the Clan.
Miss Goring.
Mrs. Dunnett.
Mrs. Henry Cox.
Mrs. H. Little.
Peter Grieve.
Princess Beatrice.
Sir R. Napier.
Sunray.

SILVER TRICOLORS.

Dolly Varden.
Duchess of Edinburyh.
Eva Fish.
Lady Dorothy Neville.
Minnie Warren.
Mrs. Col. Wilkinson.
Mrs. Laing.
Mrs. Maxwell Masters.
Mrs. R. B. Postans.
Prince Silverwings.
Princess Beatrice.
Stanstead Bride.

GOLDEN BRONZE.

Bronze Queen.
Chieftain.
Emperor of Brazil.
Emperor of Russia.
Gilt with Gold.
Golden Harry Hieover.
Maréchal MacMahon.
Mrs. Harrison Weir.
Princess of Prussia.
Swanley Bronze.
The Shah.
Zulu.

SCENTED LEAVED.

Denticulatum majus.
Filicifolium odoratum.
Grande odoratum.
Radula major.

Quercifolium.
Quercifolium minus.

HYBRIDS OF THE UNIQUE TYPE.

Conspicuum.
Crimson Unique.
Mrs. Kingsbury.
Rollisson's Unique.

CAPE SPECIES AND VARIETIES.

Ardens.
Blandfordianum.
Echinatum.
Erectum.
Little Gem.
Madame Gewitzki.
Rosy Morn.
Semperflorens.
Semperflorens Spotted Gem.
Sidonianum.

INSECTS.—All Pelargoniums, excepting Zonals and their allied kinds, are particularly liable to the attacks of aphides; few other insects trouble them. Timely fumigation with tobacco is the best means of keeping them free from these pests, which, if let to get to any considerable head, do serious mischief. It is necessary to be particularly careful in seeing that the plants are quite clear of the insects before coming into bloom, as if fumigation has to be resorted to after the flowers are open, it is sure to cause their falling off prematurely.

PENTAS.

The two species of Pentas, P. carnea and P. kermesina, are both softwooded shrubs of small growth, producing very freely their delicate flesh-coloured flowers, which appear in medium-sized bunches at the points of the shoots. They are natives of Africa, and need a moderate stove temperature, in which, with little care, they thrive well. They may be easily increased at any time of the year from cuttings of the half-matured shoots whenever these can be had; if the propagation is begun in spring, say the middle of April, at which time suitable cuttings will be forthcoming, composed of three or four joints of the terminal ends of the shoots, put three or four together in 4-inch or 5-inch pots in sand, keep them moist and covered with a propagating glass in moderate heat, and shaded when it is sunny; here they will root in three or four weeks, after which gradually remove the glasses, and when the cuttings have got inured to the full air of the house, move them separately into 3-inch pots filled with sandy loam and a little leaf-mould; keep the soil moderately moist, and shade slightly when the sun is powerful. As soon as they begin to grow pinch out the points of the growths; this should be repeated two or three times during the summer; tie the branches out horizontally, which will cause them to form a number of shoots. By the middle of July move them into 6-inch or 7-inch pots; they are free rooters, and will bear a liberal shift such as this. Stand them in a light place and give room enough, so that they may not be overhung by taller-growing things which are often allowed to seriously injure low growers like these, and so prevent them from blooming as they otherwise would. When well managed, they will keep on flowering almost continuously as growth is made, but they are more useful in the autumn, until which time it will be well to keep the flowers picked off.

Liquid manure will help them when the pots get full of roots; let them have all the light available through the autumn, for on this depends to a great extent the amount of bloom they will make. After the flowers are removed from the points of the shoots, if the wood has been grown under conditions that ensure its being well matured, the joints below will push growth, which will form flower-heads that will open in succession. The blooms are distinct and very useful for cutting. When the short days of winter arrive keep the plants drier at the roots, but not so as to cause them to flag; a temperature of 60° will suit them through the dormant season. Just before growth begins in spring cut back the shoots well, and as soon as they have broken turn them out, remove part of the old soil, and give them pots 1 inch or 2 inches larger, treating as through the preceding summer. It is better now to cut the flowers for use as they open, as it will keep the plants compact. The old examples may be kept on, managed as already advised by renewing the soil, or young ones can always be had coming on to take their place. P. rosea is also a desirable kind that will succeed under similar treatment. It has rose-coloured flowers. From Africa.

INSECTS.—Pentas are not usually much affected with insects, but should any of those that infest stove plants make their appearance, use the syringe and sponge.

PEPEROMIA.

In these we have an interesting set of small-growing stove fine-leaved plants of a soft fleshy texture, both as regards leaves and stems. Some of the weaker-growing, trailing-habited species are well adapted for hanging baskets; they are all suitable

IVY-LEAVED PELARGONIUM. *To face page 274.*

for growing in small pots for standing about in the stove or Fern house, where their prettily-marked variegated leaves are seen to advantage. They strike readily from bits of the shoots, or from single joints with a leaf attached; if these are prepared in spring and put 1 inch or 2 inches apart in good-sized pans filled with silver sand, kept warm, a little moist, not wet, and shaded from the sun, they will root readily; they must not be confined in a propagating frame or under a glass, for if so treated, they are very liable to rot. When sufficiently rooted move them to 3-inch pots filled with sandy peat or good loam, placing them where they will get plenty of light; keep the soil in a healthy state as to moisture, but not so wet as it should be for many stove subjects. A temperature that will answer for the generality of stove plants, say 64° to 66° in the night, and 75° or 80° by day during the summer, will suit Peperomias, giving air and shade in the heat of the day. By July they will want putting into pots a size or two larger, the treatment being as hitherto until September; then give more air with less moisture in the atmosphere, and dispense with shading. A heat of about 60° will answer through the winter; they will require moving to 7-inch or 8-inch pots in the spring, giving the most room to the strongest growers. Those that are to be grown in baskets may be placed several together, according to the size of the baskets to be filled; they do well hung up where they can have an abundance of light, with just enough shade to keep the leaves from getting discoloured by the sun. When the plants get shabby they may be shortened in, which will cause them to break back, and in this way their heads can be renewed, or, if preferred, young stock can be grown up to take the place of the old.

The following are worth growing:—

P. argyrea variegata. This has oval leaves, red leaf-stalks, and the margins of the leaves are broadly banded with white.

P. microphylla. A Mexican species, with trailing shoots that branch freely; the leaves are obovate.

P. nummulariæfolia. This species is of a trailing habit and the leaves are nearly round; it makes a pretty basket plant. A native of the West Indies.

P. prostrata. This also is suitable for a hanging basket; the leaves are almost round and prettily variegated.

P. Verschaffeltii. A dwarf-growing species; leaves cordate in form; deep green, with white bands running longitudinally; of compact habit. It comes from Brazil.

Insects.—Thrips and red spider sometimes gain a footing on Peperomias if the atmosphere is too dry, but with attention to syringing and sufficient care to see that the water gets well to the undersides of the leaves, they can easily be kept down.

PETRÆA.

In these we have a small genus of evergreen stove plants, well adapted for growing as climbers. They are not so much grown as their distinct character entitles them to be.

The method of propagation is by shoot cuttings, which if put in in a brisk heat during spring, and subjected to the usual conditions of moisture and shade under a propagating glass, will strike; when they are well rooted place them singly in 3 or 4 inch pots, after which keep them in a moderate stove heat, giving larger pots about the end of June. They should be shaded slightly in bright weather, but have plenty of light and a moderate amount of air when they begin to move freely; syringe them daily until autumn, when keep cooler on through the winter. In the spring, if to be grown in pots, they should have a liberal shift, if to be planted out they must have a well-prepared bed, with an extra amount of drainage; the soil should not be too deep, 8 or 9 inches is enough; good turfy peat with some rotten manure and a liberal addition of sand will suit them.

The following are desirable kinds:—

P. erecta. A shrubby species that readily adapts itself to clothing a pillar. The flowers are blue, and usually appear about the middle of summer. From South America.

P. rugosa. This is also a scandent shrub, alike suitable for using as a climber. A summer-blooming, blue-flowered species from the Caraccas.

P. volubilis purpurea. A twining-habited kind with beautiful purple and blue flowers. A Mexican species.

Insects.—Red spider is often troublesome on these plants during summer if they are not kept freely and regularly syringed; for aphides fumigate.

PETUNIA.

Greenhouse evergreen herbaceous plants. In recent years they have been so much improved by the careful selection of seedlings that have sprung from the original South American species introduced in the early part of the present century, that a good strain of seed may be depended upon to give flowers of the single varieties little inferior to named kinds.

Seed may be sown in March in pans filled with sifted loam, to which has been added one-fifth of leaf-mould with some sand; cover the seeds slightly and stand in a temperature of 60°, and they will vegetate quickly. When the little plants are large enough to handle move singly into 3-inch pots, giving them soil similar to that in which they were sown; keep close for a few days, when admit more air, and put them where they will get plenty of light. Nip out the points of the shoots as soon as they begin to grow freely, giving a little shade in the middle of the day, with air, and water to the roots as required. In six weeks move them into 6 or 7 inch pots, now using the soil without sifting, and adding to it some rotten manure; again stop the shoots, and after they have grown so as to need support put small sticks to each. They will flower through the summer, and will keep on blooming longer if assisted with manure-water once or twice a week. Young plants are best, and it is better to discard the old ones after flowering, and to propagate young stock either in autumn or early in spring. Through the winter keep them in a temperature of 40° in the night, give less water to the soil, and let them be near the light.

The double varieties of Petunia are best increased from cuttings, which may be struck in August, and treated subsequently as advised for the seedlings, keeping them in 3-inch pots through the winter, giving more root-room in spring; single varieties that are good enough to keep on may be treated in like manner.

Although, as we have said, a choice strain of seed of the single varieties may be relied on to give handsome flowers, still the following varieties are of great merit, being the selection from thousands of seedlings:—

SINGLES.

P. Bacchus. Crimson-purple and white.
P. Cannell's Favourite. Red and purple.
P. Clairvoyant. White and mulberry.
P. Distinction. Purple and crimson.
P. Dr. Denny. Crimson-maroon.
P. Dr. Hogg. Magenta, white, and purple.
P. elegans. White and crimson, beautifully fringed.
P. marginata. Rosy-purple and white.
P. Marie Seabrook. White and crimson-purple.
P. Mr. R. Owen. White and magenta.
P. Mrs. A. Mayes. White and purple.
P. Mrs. H. Cannell. White and maroon.
P. Mrs. H. Wellam. Magenta, white, and purple.
P. Mrs. S. Hibberd. White, maroon, and purple.
P. Mrs. W. Elder. White and bright purple.
P. The Hon. Mrs. Legge. Pure white.

DOUBLES.

P. Adolphe Weicke. Crimson-magenta and white; fringed.
P. Alice. Rosy-purple and white; fringed.
P. Antagonist. White.
P. Beauty of Runnymede. Plum-colour and white.
P. Crépuscule. Crimson-purple and white; fringed.
P. Duchess of Edinburgh. Light rose, white, and dark crimson.
P. Emblème. Rosy-purple and white; fringed.
P. Fascination. White, purple, and rose.
P. Lady of Plymouth. Rosy-purple and white; fringed.
P. M. Buchner. White.
P. Madame de Poultevoy. Rose, white, and purple.
P. Madame Rendatler. Claret-purple and white; fringed.
P. Minnie Evans. Rosy-purple and white.
P. posthumia. White and rosy-purple.
P. reticulata. White and dark rose; fringed.
P. roseate. Rose and dark maroon-purple.

INSECTS.—Aphides, which are often troublesome on Petunias, should be destroyed by fumigation.

PHILESIA BUXIFOLIA.

There is only one species of the genus in cultivation; it is a pretty evergreen plant, all but, if not quite, hardy in some parts of the kingdom, but it is worth a place in a greenhouse. It is a slow grower, and is difficult to strike from cuttings. It is best increased from suckers, which the plant produces freely; these should be taken off in spring before growth begins, and put singly in pots large enough to hold the roots attached with a moderate quantity of soil; peat, with a fair amount of sand added, will suit it. Grow on with ordinary greenhouse treatment as to air, water, and general attention, and the year following, in spring, give them pots a size or two larger, but, as already said, the plant is a slow grower and does not require so much root-room as some things. The flowers are red, produced in summer. It is a native of Chili.

INSECTS.—The plant is little troubled with insects, but sometimes aphides affect the young shoots; for these fumigate, or syringe with tobacco-water.

PHILODENDRON.

A singular genus of evergreen stove plants, with thick fleshy stems and large, handsome leaves, quite distinct in their appearance. One of the best known of the family is often met with under the name of Monstera deliciosa, the massive foliage of which has such a distinct appearance. In their native countries they scramble on the ground, or over the shrubs and low trees that happen to be near them. In a cultivated state they are seen to the best advantage when grown on the back wall of a house.

They are easily increased by division of the stems, which if cut into lengths of two or three joints, inserted in pots, and treated in the ordinary way of cuttings, in a brisk heat, soon get established, and make top growth. They are not particular as to soil, providing it is moderately loose and open —turfy loam, with one-fifth of leaf-mould and some sand added, answers well for them. All that is required further is to give larger pots as the plants increase in size, if to be grown in this way, but in a large house where room can be found and there is a suitable wall for them to cover, they may be planted out. They do best in a moderately high temperature in summer with as much heat during winter as answers for most stove plants; give plenty of water in the growing season with enough light to keep the leaves from getting drawn, and make free use of the syringe daily in summer. No more shade should be used than needful to prevent the leaves being scorched.

The following are fine kinds :—

P. erubescens. A handsome species with cordate leaves; the leaf-stalks are shorter in this kind than in some of the others. It comes from the Caraccas.

P. Lindenii. A stout-growing species from Ecuador.

P. pertusum (Monstera deliciosa). This has very large foliage, singular in its formation, looking as if portions of the leaf-blade had been cut out. It is a very strong grower. West Indies.

P. pinnatifidum. A handsome species, similar in character to the last-named. It also is a West Indian kind.

INSECTS.—Few insects can find harbour on the smooth leathery leaves of these plants, and if at all affected their texture is such as to permit of the syringe being used with force enough to clear away the parasites.

PHŒNICOPHORIUM SECHELLARUM.

(Syn.: Stevensonia grandifolia.)

This is a hot stove species, and one of the grandest of all cultivated Palms. The stem is well-proportioned, sufficiently thick, but not so as to detract from the elegant appearance of the plant; the leaves are of immense size, plaited, and entire, deep green in colour, with often a number of small reddish spots over the surface; the leaf-stalks are heavily spined. From the Seychelle Islands.

For propagation and cultivation, see Palms, general details of culture.

PHŒNIX.

A very handsome genus of Palms, several of which have the merit of being cultivable in a temperature little above that of a greenhouse. They are also interesting from the fact that one of their number, P. dactylifera, yields the dates of commerce.

Propagation and cultivation will be found under Palms, general details of culture.

P. dactylifera. This is a stately plant, with an upright habit of growth, and large pinnate leaves. It is very pretty in a small state. From the Levant.

P. reclinata. This species has a handsome appearance in all its various stages of growth, but especially while young, in which state its spreading pinnate leaves, prettily arranged on the plant, make it an attractive object. Africa.

P. rupicola. A very handsome stove species, with unusually short leaf-stalks; the leaves are pinnate, and beautifully arched, giving the plant while in a young state an elegant vase-like appearance. It comes from India.

PHŒNOCOMA PROLIFERA.

This very beautiful and remarkably distinct evergreen greenhouse plant is a native of the Cape of Good Hope. The flowers are of the character designated "everlasting"; they are bright crimson, produced freely on well-managed plants, and as large as a five-shilling piece. They remain in good condition for several weeks, and even for much longer they are presentable, but it is not good practice to allow them to remain on for an unlimited time, as this tends to weaken the plants, and prevents the necessary growth for the season following. The Phœnocoma suffers more from this treatment than most plants, consequent upon its late-flowering disposition, since it naturally comes in later than most hardwooded subjects, and is often kept back for decorative or exhibition purposes long after the time that the flowers should have been removed and the plant making growth for the ensuing season. It is, like all others from the same latitude, a light-loving subject, that cannot endure at any season to be kept in a dark situation, or where the atmosphere is too close. It is of quicker growth than some things it is nearly allied to; on the other hand it does not, as a rule, live so long, but it is a good grower, not so liable to go off suddenly as some of the occupants of this department. The plant will succeed in loam, in which soil some grow it, but we prefer good ordinary peat.

Cuttings made of the points of the young moderately strong shoots, some 3 inches in length, put in about the beginning of August, several together in 6-inch pots filled with sand, stood in an intermediate temperature, kept moderately but not too close, fairly moist and shaded, will root during the autumn, when remove the glasses, giving more air and keeping through the winter at about 50° in the night. As soon as shoot growth is moving pinch out the points. In March move singly into small pots filled with fine peat and sand, keeping up a growing atmosphere, with a little shade when the sun is bright, and the material on which the pots stand moistened daily. Place them in a light position and give air in the middle of the day. By the end of June move into 3-inch pots; use similar soil and treat as before up to the end of August, when cease shading and give more air. Winter at about 45° in the night, and keep the soil now a little drier; in March move them into 6-inch pots, using soil as before, and again pinch out the points of all the strongest shoots. When they have begun to move freely give a little more air than during the previous summer, in other respects treat as before, except that the strongest shoots should now all be tied out in a horizontal position. Admit more air again as the autumn advances, and place them for the winter in a good situation near the glass, in a dry house where there will be no drip upon them nor any accumulation of moisture, otherwise they may lose their inside foliage near the base of the shoots, and be thereby much injured both in appearance and reality. A temperature of 40° will now answer for them in every way; they require a little more water at the root than most hardwooded species, as they are never completely at rest, but keep growing on slowly through the winter.

Give them a 3-inch shift early in April, using good fibrous peat, lighter in texture than required for some plants; break it moderately fine, and use sand in sufficient quantity to keep the whole in good open condition. Shade in bright weather slightly and keep the atmosphere a little damper, but do not syringe this plant overhead at any time. Again bring the shoots in a horizontal position close down as low as the rim of the pot will admit. This is essential with the Phœnocoma, as it is naturally inclined to grow erect, and if the shoots are not trained out while they are young, they will split off when the attempt is made to train them when they get older; the points of the shoots will soon turn up, the weaker ones near the centre of the plant will gain strength, and the growth become equalised.

Treat during the spring months similarly to other young hardwooded stock. Give slight shade when required through the summer up to the middle of August, after which it should be discontinued, and air may be left on all night, so long as there is nothing to fear from frost. Attend to them in training, by keeping any shoots that take the lead well down, and if there are any much stronger than the rest pinch out their points, which will cause them to break back and fill up. Pot again in spring as advised for the preceding year, giving a 3 or 4 inch shift, according to the strength of the plants, and the condition the roots are found to be in. The soil will now do used in a little coarser state, but must be equally good as to its containing plenty of fibre, with sufficient sand, and the drainage must be ample and well secured by either a thin layer of sphagnum or pieces of turfy peat. The plants will this season make some flower, and it becomes a question, which will be best answered by each grower, whether they are to be allowed to remain on, or be taken off and growth encouraged. If the object is to get the plants as large as can be in the least possible time, then they should not be allowed to flower; but when there is a disposition to use them while young for decorative purposes, no harm will be done by letting the flowers open, providing they are not left on too long, and the plants are not injured by being crowded among other things. But if they do not show flower in good time, that is, so that it will open early in June, it should not be allowed to remain on, or it will interfere with their making growth for the ensuing season's flowering. Their autumn treatment will need to be as before, but in the winter they will require more careful tying, so as to put them in proper form for flowering the following season, when, if all goes well, they should make nice small blooming specimens.

Pot them again in April; it will in no way interfere with their flowering, providing it is done with care and the plants are not allowed to suffer either from the want of water or from receiving too much until the roots get hold of the new soil. The flowers should not be allowed to remain upon the plants more than six weeks after opening, otherwise they will interfere with the ensuing season's blooming; it is to this cause that is generally attributable the lack of flowers upon these plants two seasons in succession. By the autumn they will have made such progress as to be large enough for exhibition specimens the ensuing summer it required. Keep them near the glass through the winter, which has the effect of causing many shoots to flower that otherwise would not; this is often the case with plants of the character of the Phœnocoma that do not bloom from the mature wood of the previous season's growth, but keep on growing all the year, and flower from the points of comparatively soft shoots. Tie and put them into shape during the winter. As to potting this season in the spring, or deferring it until after they have flowered, that can best be determined in the case of each individual plant. Any that appear as if they would suffer for want of sustenance at the root by being very large and strong, proportionate with the size of the pot they already occupy, had better be potted on as hitherto in April; but where the reverse is the case, it will be well to defer the operation until they have flowered, or even till the spring following, for, although it is always wise to give a plant in its younger stages all the root-space requisite to get it on in size as quickly as possible, yet, when once a good start has been effected up to a certain size, determinable in the case of each particular species of plant, it is better not to transfer it into a larger pot more quickly than requisite. This, of course, applies to such as the species under consideration, which do not admit of being shaken out, or of a reduction of the ball being made, so as to renew the soil, as may be done with coarse-rooted plants that will bear partial disrooting.

If they do not receive larger pots until the ensuing spring let the transfer be made by the end of March, as, now that the plants have attained size, they cannot be removed with so little disturbance of the roots as when smaller, and if the potting is deferred until later it may have the effect of injuring the season's bloom. It must be borne in mind that this plant can never be induced to flower freely if under-potted. The quantity of bloom produced will depend upon the strength of the plant. It is liable in time to get bare and denuded of leaves at the bottom, and in such state is very unsightly, but if the branches have been kept trained down as advised, there can be no difficulty in covering this defect, for, with the exception of their being liable to split off at their junction as already stated they will bend freely in any direction.

There are two forms of Phœnocoma—the old kind, now seldom seen, which is a shy flowerer; and the one most generally met with, Barnes' variety (Phœnocoma prolifera Barnesii), which has much larger flowers and is stronger in its growth. It may be easily recognised in small plants, if strong, as the lateral branches are depressed, giving each vigorous shoot much the appearance of a miniature specimen of Spruce Fir; this is much the finer variety.

INSECTS.—Phœnocomas are but little subject to the attacks of insects; though occasionally red spider will make its appearance upon them, in which case the plants should be laid down on their sides, and thoroughly syringed with clean water three or four times, at intervals of a few days. They must never be allowed to stand, especially in the autumn and winter, where anything in the shape of dead leaves from other plants can fall upon them, for, as these decompose, they will communicate mould to the foliage of the plants.

PHORMIUM TENAX.

This plant is known as the New Zealand Flax; it is nearly hardy in the southern parts of the kingdom. Its erect, straight, sword-like leaves have a distinct appearance associated with flowering, or other fine-leaved kinds. Its habit of growth is like that of the common hardy Flag Iris, and it is propagated by division of the crowns in spring before growth commences; these may either be divided singly, or kept several together, in either case pots big enough to sustain the season's growth should be given. Treatment such as suited to the general occupants of the greenhouse, in the matters of light, air, and water, is what is required, as the plant is easily managed. All further needed is to give increased room each succeeding spring to maintain healthy growth; when too large the specimens may be divided in two or more parts at discretion.

The plant is a native of New Zealand; its flowers are white, but they possess little beauty. Besides the green-leaved species there are several variegated forms much more attractive in appearance.

P. tenax Colensoii. Has prettily-variegated leaves.

P. tenax variegatum. The leaves of this kind are half creamy white.

The treatment required by these is in no way different from that which meets the wants of the green kind.

INSECTS.—The hard texture of the plants is such that few insects molest them. Syringe freely during the summer to keep down red spider. Should scale become troublesome sponge with insecticide.

PHYLLOGATHIS ROTUNDIFOLIA.

A handsome-leaved stove Melastomad, the chief attraction of which is its distinct foliage. The leaves are large, heart-shaped, and toothed on the margin; glossy green above, reddish-brown beneath. It requires similar treament to Sphærogynes, which see. A native of Sumatra.

PHYLLOTÆNIUM LINDENII.

A stove Aroid that used to be known under the name of Xanthosoma Lindenii. It is nearly allied to the Caladiums; the leaves are sagitate, with white ribs which stand out in bold relief from the bright green ground colour of the leaf-blade. It requires treatment similar to the Alocasias, which see. Introduced from New Grenada.

PHYSIANTHUS.

Evergreen climbers that will succeed in a greenhouse temperature, and are occasionally met with trained to the rafters, or on the walls of a cool house.

They are propagated by cuttings struck in spring in the ordinary way, in a moderate stove heat; when rooted pot singly in peat with some sand added; keep in an intermediate temperature until well established, after which greenhouse warmth will suffice through the autumn and winter. In spring plant out in a bed of peat to which add a little rotten manure and some sand, and train the shoots as they extend to the wires intended to support them. The plants will last for many years if top-dressed in spring with new soil, and assisted through the growing season with manure-water.

P. albens. A white-flowered species; blooms in summer. From Buenos Ayres.

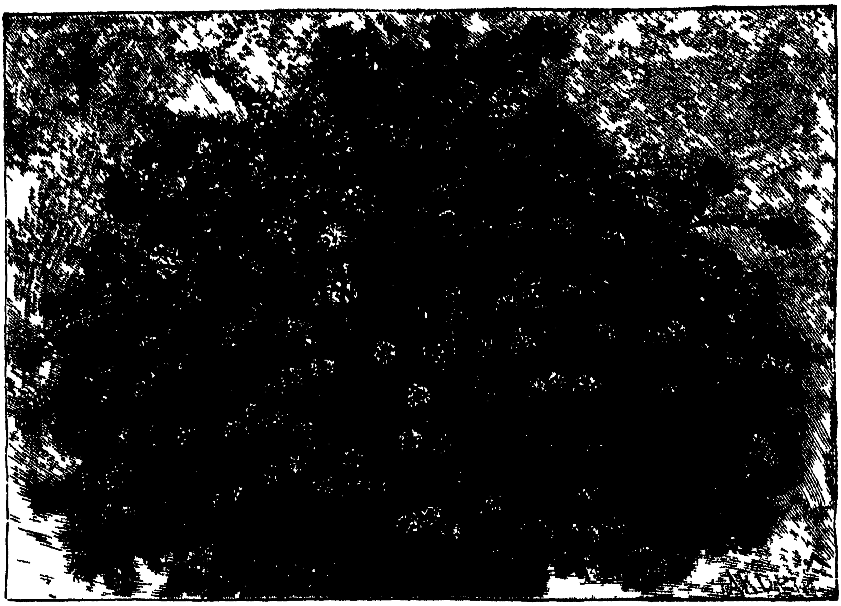
P. auricomus. Has white and yellow flowers, produced in autumn. From Brazil.

INSECTS.—Aphides and red spider are often troublesome in the summer on these plants; fumigate for the former and syringe freely with clean water to remove the spider. Brown scale will also live on them; for these cut in the shoots freely after blooming, and syringe with insecticide.

PIMELEA.

These well-known evergreen greenhouse plants are from New Holland, and have long been favourites for pot culture. They differ very considerably, not only in the size and colour of the flowers, but also in general appearance. Of late years they have not been so much grown as in times past, neither does their cultivation appear so well understood by the plant-growers of the present day as by those who some years ago used to produce them in such fine condition. This may be accounted for in this way: they are plants that are naturally suited by their general habit for exhibition purposes, and the exhibitions of the present day are not held so early as they were in years past when the London shows used to commence in the beginning of May; now there is rarely anything of the sort attempted until later in the month. This necessitates the whole of the greenhouse hardwooded stock being kept several degrees cooler all through the winter than would have been necessary under the old time of commencing the exhibitions, and these plants do not well bear this lower temperature, not liking to be kept under 40° to 45° in the night.

The different varieties of Pimelea require more water than many plants from the same country, to some extent at the root and in the atmosphere, but more particularly directly overhead, in the shape of daily syringings during their season of growth; without these they become a prey to red spider, which soon does irreparable injury, damaging the foliage, and quickly inducing a hardened condition of the wood, which prevents free growth, a state from which they rarely, or never, fully recover. The above remarks apply in general to the different species, but as in other matters relative to their culture they differ considerably, it will be necessary to treat of them in some measure individually.



Pimelea Spectabilis *To face page* 280

Chinese Primula, "White Perfection" *See page* 295

The first of the family undoubtedly is P. spectabilis rosea; this variety forms the largest plant, and has proportionately large flowers, which it produces freely from the points of the shoots in large ball-like heads, white suffused at the points with rose. They are alike distinct and handsome, and, from the time they begin to open until they fade, they will last about three weeks. This plant will grow in either peat or loam; we prefer the latter where it can be had of good yellow quality and containing plenty of fibre; in such it grows stronger than in peat.

All the kinds of Pimelea strike readily from cuttings made of the points of the young shoots, which should be taken off when about two inches long in April; put them an inch or two apart in 6-inch pots in sand, keep moist, shaded, and covered with a bell-glass in an intermediate heat; here they will soon strike, after which remove the glass, and as soon as a moderate amount of roots are present move singly into small pots, using for this first potting a mixture of peat and sand. Let the atmosphere be moist and close, with shade in the day until they have begun to grow away freely, after which pinch out the points of the shoots; keep the material on which the pots stand moist, damping overhead with the syringe daily through the summer. By July admit a little more air, and only shade when the sun is on the glass; keep the young plants moderately near the light. Give a little more air in autumn, and winter at about 45° or 48° in the night; in this way they will move slowly through the winter, and be in a condition for shifting into 3-inch pots by the middle of March, when they should be given soil similar to that used at the first potting. Again stop the shoots as soon as they begin to move freely, and treat through the summer as in the preceding, with the exception that they will now bear a little more air. In September give more air, and winter at 45° in the night. Again in March move them, this time into 6 or 7 inch pots, now using loam in place of peat; stop the shoots when they have made a little growth, and as soon as they have fairly broken afterwards tie out the strongest, bringing them down to a horizontal position. This summer treat as to water at the roots, moistening the material on which they stand, syringing overhead, and shading from the sun, as heretofore advised, giving more air as the plants get stronger and further increasing it in autumn. Winter as recommended for the preceding, and again in March give a 3-inch shift, using the loam in small lumps the size of walnuts; add one-sixth of clean, sharp sand, drain effectually, and pot firmly. Place them where they will receive no side air for three weeks, and keep the surface on which they stand damp, closing the house with the sun upon it, and syringing the plants lightly overhead at the same time. They also must be carefully shaded all through their growing season when the sun is powerful. This latter is not nearly so much attended to in the cultivation of Pimeleas as it should be. The flowers on the points of the shoots in good healthy plants will by this time be getting prominent, but we do not approve of their being removed early in the season, as in the case of most things, for the reason that if such is done the shoots will require stopping during the summer, which is rather a disadvantage than otherwise, causing them to make weakly growth, and to set prematurely—moreover, it deranges their time of flowering. Still it is better this season not to let the blooms open fully, as the plants would be weakened and there would be no adequate return from what little flower they could make at this size, so as soon as they begin to open they had better be removed. Immediately below the base of the flower, on each branch that produces them, will be seen several young shoots breaking; many growers are tempted to allow these to remain, hesitating to remove them, but neglect in this matter is calculated to spoil the plants, by allowing them to get too long in the branches for the number of shoots they carry. The right distance to cut them back to is midway between the flowers and the place where they were cut back the preceding year; this will keep them close and bushy. Encourage them to grow freely through the summer by sufficient shade, closing in sun-heat, and the use of the syringe as already advised. The latter should be so used that the water can be got well to the underside of the leaves; and the plants should be turned round occasionally, so that the whole surface can be well wetted, or they will get affected with their greatest enemy, red spider. Continue this treatment up to the end of August, when the syringing may be discontinued, as also the early closing; give less shade, to harden them up a little for the winter, when they should be placed in a good light situation, where they will be kept in a night temperature of as near 45° as possible.

We have said nothing about training, as the plants from their habit require very little; a few sticks may be placed to them so as to bring the branches down to keep the base well furnished, but beyond this, and simple support, they will need nothing. During the winter they will not want nearly so much water, but they must not be allowed to get so dry as some occupants of the hardwooded house. If the intention is to grow them on to a specimen size quickly, it will be advisable to remove the flowers again in the spring, as advised the preceding season, cutting back the shoots similarly and treating in every way the same. The size of the pots they are moved into must be determined by the quantity of roots they have; if very full, they will require a 4-inch shift, and the soil should be in a little more lumpy state. As the plants get larger they will need greater care in getting the water with the syringe well to the inside leaves, without which they are certain to become affected with spider, and if once they are injured by this pest no after-treatment can set them to rights. Shade from the sun as advised for the preceding seasons. By the end of this summer they will get to a useful size for decorative purposes, and as such can be used for conservatory work, giving them whilst here an open, light place, not crowded by other things. After being similarly treated during another season, the plants will, if all goes on right, have attained the size of moderate specimens, and if required for exhibition will, from their distinct character, be well adapted for the purpose in the early part of the season. Their requirements in after years will be similar to those prescribed so far, until they get into 18 or 20 inch pots, in which size they may remain for some time, assisted during the growing season with manure-water; afterwards, if they become at all bare of leaves or indicate weakness, they may be destroyed, to make way for younger ones.

P. decussata, P. Hendersoni, and P. mirabilis are species of comparatively small growth, and produce a profusion of handsome pink flowers less than those of P. spectabilis; like it they are compact, neat-habited, dwarf bushes, flowering in May and June; they also will do in either peat or loam: in the former they grow the quickest, in the latter the flowers are usually higher coloured; they all are free growers, but do not attain nearly so large a size as P. spectabilis. The strongest branches require in the early stages of their growth to be kept well down in a horizontal position so as to lay the foundation for furnishing the base of the future specimens, otherwise in a short time the bottom becomes bare and naked, and the plants are made unsightly, a condition much more common than it might or need be. If this matter of training is not attended to while the plants are young and the shoots pliable, no after attempt at bringing the branches down will give them the desired appearance, for they do not bend well when they have got strong, and bringing them down leaves the middle of the plant thin.

The above kinds, as well as those mentioned below, require to be treated generally in the way advised for P. spectabilis, only with less pot-room proportionate to their weaker growth.

P. elegans is a very distinct species, with a somewhat looser habit of growth than the preceding; the leaves are ovate-lanceolate and much larger than in any of the others named; the flowers, which are produced in spring freely, are compact and globular, about the size of large heads of red Clover, and are yellowish-white in colour. The plant makes stronger wood than the three last treated of, and should be well cut back each season after flowering or it gets into a somewhat straggling condition. This kind does the best in loam to which is added a good amount of sand; potting and general treatment similar to the others.

P. hispida is a somewhat weak-wooded subject, of moderate size. If well managed it will flower two or three times during the season, or its blooming may be retarded by stopping the points of the shoots, as after it has made a couple of inches of growth it will set and at once bloom. The flowers are produced in loose bunches similar to those of P. spectabilis, but not so large as in that kind; they are white, tinged with pink. It is very useful, either as a summer or autumn exhibition plant, or simply as a decorative subject for conservatory purposes. It does best in peat, and at no time requires the shoots reduced further than by removing the flowers, as its persistent habit of blooming prevents them running to any considerable length. Plants in 6-inch pots in the spring should be grown on and not allowed to flower for a couple of years, as its free-blooming disposition prevents it growing. The flower-buds should be removed as soon as formed until the plants have got to something like 15 inches in diameter, after which they will bloom twice in the season —in spring, and again in the after part of the summer.

P. Neippergiana is a small-growing, white-flowered species, that blooms in the spring. In cutting back, potting, and general summer and winter management, it requires to be treated like the others already spoken of; but being a weaker-rooted plant it succeeds the best in good fibrous peat, to which add one-sixth or one-seventh of sand, according to the nature of the peat.

INSECTS.—As to insects, it will be understood by what has been said that the whole of the species are more than most things subject to the attacks of red spider, and unless they are kept free from it their cultivation will not be satisfactory. The continued use of the syringe as advised will keep them clear from this pest. Greenfly sometimes affects them; for this fumigate. Brown scale will live upon them, but does not increase fast, and can be removed with a sponge and brush. If affected with the white species of this insect it is better to destroy them, as the plants will not bear any dressing that will kill it.

PLATYCERIUM.

The few species of which this genus of stove and greenhouse Ferns is composed are among the most singular of all vegetable forms. They offer a marked contrast not only to other Ferns but to all cultivated plants. P. alcicorne, the Elk's Horn Fern (so named from the likeness the fertile fronds have to the horns of that animal) is the best known kind, but by no means the finest; for size and general appearance the palm is borne by P. grande and P. Wallichii, both of which are majestic plants.

For propagation and cultivation, see Ferns, general details of culture.

STOVE SPECIES.

P. biforme. East Indies.
P. grande. Malay Archipelago.
P. Stemmaria. Africa.
P. Wallichii. Malacca.

GREENHOUSE SPECIES.

P. alcicorne. New South Wales.
P. Willinkii.

PLATYLOBIUM.

Evergreen greenhouse shrubs that bloom freely, but only hold a place second to many in cultivation.

Their method of propagation and subsequent treatment is similar to that which answers for Chorozemas (which see) except that they do not require the shoots to be stopped in their early stages so often as is needful in the case of the taller-growing Chorozemas.

The following are the best kinds:—

P. formosum. Flowers orange, produced in summer. A native of New Holland.

P. Murrayanum. Has yellow and red flowers; a spring bloomer. From Van Dieman's Land.

P. triangulare. Orange-coloured flowers; blooms in summer. From Van Dieman's Land.

PLATYLOMA.

The species included in this genus of stove and greenhouse Ferns are few in number, and not so important from the gardening stand-point as many others. Those requiring cooler treatment will generally be found the most desirable.

For propagation and cultivation, see Ferns, general details of culture.

GREENHOUSE SPECIES.

P. brachyptera. California.
P. Brownii. Australia.
P. flexuosa. Peru.
P. intermedia.

PLEROMA ELEGANS.

This is an evergreen greenhouse species, and when first flowered in this country, many years ago, it made quite a sensation, its unrivalled rich purple blossoms were the admiration of all who saw it—and no wonder, for, when seen either by itself, or in company with other flowering subjects, it has few rivals. It is, however, when the plant, well flowered, stands beside something complementary in colour—say a good example of Allamanda, or a nicely bloomed Cassia corymbosa—that it is seen to advantage. Yet so distinct is it in colour and habit, that there is not a plant with which we are acquainted, of any colour, either in the conservatory or on the exhibition stage, that it does not harmonise with, and that is not improved by its presence. The individual blossoms do not last very long on the plant—some three or four days from the time they open—yet this is compensated for by their being produced in succession in clusters of three to half-a-dozen on the points of the shoots. When cut their duration is somewhat similar, but if taken from the plant when half open, there is no flower in existence that is more telling in a bouquet to be seen by daylight. Under the influence of artificial light the flowers lose much of their lustre, consequently they are not to be recommended for use under such conditions. It is found indigenous in the Organ Mountains, so will bear a little more warmth than some greenhouse plants; in fact its cultivation has been attempted in the stove, but so treated it does nothing but grow, never getting enough rest to ripen its wood preparatory to flowering.

The plant is easy of propagation, growing freely from half-ripened cuttings, taken off at any time of the year when they can be obtained in such condition. If about the beginning of August they are put singly in small pots half filled with sand and loam, the remainder all sand, stood in an intermediate temperature, kept moderately close, moist and shaded they will root in a few weeks, when they should be exposed to the full air of the house. When they begin to grow away freely pinch out the points, and give them a light position through the autumn in a night temperature of 45° or 50° ; during the depth of winter the lower of the above temperatures will be enough. Give sufficient water to the soil to keep the roots moving ; about the middle of March move into 3-inch pots, and as soon as they start fairly into growth, again pinch out the points of the shoots. Directly the sun gets at all powerful shade in the daytime ; keep the atmosphere a little closer than that of a greenhouse, giving a moderate amount of air, as the days get longer syringe in the afternoons when the house is closed, and by the end of June move them into pots 3 inches larger, after which continue to treat as before until the end of August; during the summer again stop the leading shoots. Dispense with shading and syringing, and give more air through the autumn, and winter in a temperature of about 40° in the night. It will grow well in either peat or loam, but we prefer the latter where it can be had of good quality, containing plenty of fibre; in such it grows stronger and shorter-jointed, and has a greater disposition to flower freely than in peat. There is one thing this Pleroma is subject to suffer from—too much exposure to strong sunlight; in fact, we often see it grown well in an old-fashioned house glazed with small glass, and with the accumulation of dirt under the laps usually found in such structures. When it is grown in a very light house it must be slightly shaded in bright weather, otherwise its leaves become so much disfigured as to seriously interfere with its appearance, even when well-flowered—we have seen this injury occur in bright March weather. Nor should the plant be in the winter time submitted to so low a temperature as the generality of greenhouse stock will bear; 40° in the night is low enough for it.

Again towards the middle of March the roots will be sufficiently active to admit of their being moved into pots 3 inches larger; add to the loam one-sixth clear, sharp sand, drain well, and pot firmly, placing the plants where they will be a little close, without exposure to the sun's full rays.

This Pleroma possesses what plant-growers call a good habit, not being too much inclined to run up with a few straggling branches; but, to ensure the requisite equality of strength among the shoots from the commencement, the leading ones should be stopped sufficiently to cause an equal disposition of the sap in all the branches near the base; the omission of this, in the first stages of the plant's existence, destroys its after appearance, as if the shoots near the base are weak they soon die off to an extent not usual in most plants. Train all the strongest shoots to the outside of the pot—this will cause the weaker ones to gain strength; any that appear to take the lead must have their points pinched out all through the summer. As the weather gets warmer again use the syringe in the afternoons, damping the under as well as the upper surface of the leaves, as the plant is sometimes, although not often, affected with spider. By the middle of June, if they have made their wonted progress, they will again require potting, let them have another 3-inch shift, and use soil similar to the first; grow them on as earlier in the season, giving them the necessary attention in respect to water, which they require in greater quantities than most hardwooded greenhouse plants, consequent upon their freer growth, and much greater evaporating leaf surface; continue also to shade sufficiently to preserve a healthy condition of the leaves. The shading will have to be accommodated to the character of the house—that is, whether it is very light or otherwise. Admit sufficient air every day to induce short stout growth, and by the end of August discontinue the use of the syringe, give more air and less shade. Keep through the winter, as before advised, in a night temperature as near 40° as may be. The plants must be tied into shape, which will be easily done, from their natural symmetry. In the spring, at the same time as advised last year, repot, giving a 3-inch shift, and treat as in the preceding season in respect to stopping, shading, and watering; close the house with a little sun upon it, and at the same time maintain a sufficiently humid condition of the atmosphere in the evenings by using enough water on the stages and paths. The plants will not require a second shift this season, and by the middle of July should receive a full complement of air day and night.

By the middle of August remove them to the open air; but here they must not be submitted to the direct action of the sun; they should be placed on the north side of a tall hedge or trees, where they will not receive more than its morning and evening rays. Syringe them while here in the evenings during bright weather. Before they are thus turned out they must have sufficient sticks put to them so as to properly secure the branches, otherwise they will be liable to break with the wind. Do not let the plants remain out later than the middle of September, or they might be injured by frost, and it is unnecessary to risk them, for the month's exposure will have sufficiently ripened their growth to induce their flowering freely. Winter as before, keeping them well up to the light. Tie them into the required shape, and as early in the season as there is danger of their suffering through the effects of the sun, either shade slightly or remove them to where they will not be exposed to its mid-day influence.

In respect to flowering, there is no particular time through the summer that it can be exactly calculated upon, as in the case of some other plants—much will depend upon the situation where it has been wintered. It is not a plant that can be hurried on; if any excitement were attempted by heat it would run into growth, and not flower at all. We have had it in by the beginning of June, and on other occasions not until the end of August. When in flower the plants can be removed to the conservatory, where they will be very effective. Place them where they will not be too much crowded. They will last here for a month, after which they should be removed to the growing-house, and have any shoots that are unduly taking the lead shortened back. If they have flowered early in the season they will have sufficient time before winter to make growth for the next year's bloom, in which case they ought to be moved into pots 3 inches larger, and in the autumn turned out for a few weeks, and then tied and wintered as before—but so treated they never bloom so profusely as if allowed a season's rest. More commonly they are only flowered every other year, in which case the plants should be shortened back somewhat freely after blooming, then placed in a house where they can be enabled to make some growth without any attempt at pushing, as they will have time sufficient the ensuing summer to grow into a large size. When so treated they had better not be potted until the spring; give them as heretofore a 3-inch shift, and subject them through the summer to the same treatment as advised in their early stages, as to shade and water, and also as to exposure out-of-doors; but this season they may be placed out by the end of July, at which time, if all has gone well, they will be large enough for any purpose for which they may be required, even to exhibit in the company of the best and most select collection of plants, among which there are few more telling subjects.

After this flowering they should be cut to within a foot or 15 inches of the base, placed in a growing temperature, and syringed overhead every afternoon until the end of August, when they should have plenty of air, and the syringe should be withheld; it will not be necessary to place them in this state out-of-doors, for under any circumstances they cannot be expected to flower much, if any, the ensuing season. In the spring turn them out, reduce the balls, and replace in the same pots with new soil; encourage growth through the summer, and put them out in the open air as before advised to ripen; train so as to keep enough young shoots to furnish the base of the plant with green healthy growth. This will be facilitated by the production of a number of shoots from the crowns of the plants, which the cutting back will have caused them to make. After flowering this time it is as well to discard them for younger stock, which should be brought on to succeed the old plants—this is the more advisable with this Pleroma as it is a free grower, making as much progress in a single season as many things do in two; besides younger plants always have a fresher appearance. All that is necessary is, each year, to provide a few young ones to replace those that are made away with, for it is naturally such a good grower that unless very badly treated it rarely goes off or gets out of health. On this account it is fitting for beginners in the cultivation of hard-wooded plants, while as a subject for general decorative purposes it cannot fail to give satisfaction.

INSECTS.—This Pleroma is seldom attacked by insects; sometimes red spider will make its appearance, but this will not occur if the syringe is employed as advised. Scale, either brown or white, will live upon it, but in case the plants become infested with either of these insects it is better to destroy them, as the leaves are too soft to bear dressing with any solution strong enough to kill the pests.

PLUMBAGO CAPENSIS.

This is a Cape plant introduced more

than half a century ago. It is one of the most generally useful hardwooded greenhouse subjects, not nearly so much cultivated as it deserves to be on account of the numerous ways in which it may be grown; for it succeeds equally well in a large pot, as a trained specimen to twine round a pillar, planted out to clothe a wall, or to hang loosely from the roof of a cool conservatory, or confined to the limits of a 6-inch pot, in which way it will flower freely, forming one of the best possible window plants; to this size it may be restricted for years, occupying a very limited space in winter, and amply repaying the little attention it requires by flowering for weeks in succession. The flowers are produced from the extremities of the young shoots, and are borne in large bunches; individually they are like a small Phlox in form, but of the most lovely pale blue colour. There are few plants grown that offer such a pleasing contrast in both colour and form of flower to the generality of other blooming subjects, as does this Plumbago. It is a free grower, and not at all difficult to manage, either in a small or large state.

There is no way that it can be grown in which it is more useful than in small pots, for general decorative purposes, as, if a number are at hand, a portion, if desired, can be brought into flower in a little heat earlier, to precede such as are allowed to come on gradually in the greenhouse; by this means a succession may be kept up for three months in summer and autumn. Being a strong-rooted plant it will succeed well in loam, as it, in common with most things that will thrive in this description of soil, has in it a greater disposition to flower than if in peat; but the loam should be good in quality, and contain plenty of vegetable fibre, and should have added to it one-sixth of sand; the pots should be well drained.

This Plumbago strikes readily from cuttings made of the young shoots taken off in spring when 4 or 5 inches long; these will be forthcoming from plants that have been cut back earlier, and if they have a heel attached all the better. Put them singly in little pots filled with loam and sand, the surface all sand. Keep under a bell-glass, or in a propagating frame, moist, and shaded in moderate heat; they will soon root, after which inure them to the full air of the house. When well rooted move into 3-inch pots, using ordinary loam and a little sand; syringe overhead in the afternoons; pinch out the points of the shoots, stand them where they will get plenty of light, and now give more air. The young plants will grow fast, and by the end of July should be moved into 5-inch pots; continue to treat as advised after the first shift until the middle of August, when leave off syringing and admit more air, with a drier atmosphere. Winter this season at about 45°, and towards the end of March, just as they begin to grow, let them be potted; it is necessary now to determine to what size they are intended to be grown. If the object is to keep all or a portion for flowering in a small state, these should be moved into 6 or 7 inch pots.

If the intention is to grow them larger they ought to have pots at least 8 or 9 inches in diameter. In other respects the treatment they require is the same, except that the smallest-sized may need to be kept stopped in closer, so as to induce a proportionately more compact habit of growth. Pot them moderately firm, and if the shoots are at all straggling, shorten them back to about 8 or 10 inches in length, tying them out horizontally well down so as to induce them to break back, in which way they will push almost every eye. Place them in a house or pit, where they can be kept at a temperature of about 45° in the night, with proportionate increase in the day with sun heat; close the house early enough in the afternoons while the sun is up, so as to raise the temperature, syringe them overhead at the same time, and as the season advances and the weather gets hot, give a little shade, and use sufficient water under the stages, and about on the paths to keep the atmosphere in a moist condition to promote free growth. All that will be required through the spring and early summer, will be to pinch back any shoots that may show a disposition to outgrow the others, and tie to sticks so as to keep them in shape. About August they will commence to bloom, and as soon as the flowers begin to open cease syringing. They may then be moved to the conservatory, or any place where flowering plants are required—where they will receive a moderate amount of light and air to ripen up the growth, no more of which for the season should be encouraged. When the blooming is over give less water and place the plants for the winter in an ordinary greenhouse temperature of from 35° to 40° in the night. They may be either cut back at once, or this can be deferred until nearer spring; the shoots of such plants as are intended to he grown on in the small pots should be cut to within a few eyes of where they were shortened to the spring previous; again, about the end of March, before they begin to grow, turn them out, shake three-fourths of the soil from them, replace them in the same pots with new soil, and in every way treat as in the preceding summer; so managed annually they will last for years, flowering freely. They may during the season of active growth have manure-water given them once or twice a week, which will enable them to make stronger shoots and finer heads of flowers. Such as are intended for larger specimens should not be cut in nearly so close, the shoots may be shortened to within about 12 inches of where they were cut back to in the spring previous; if the plants have made satisfactory progress they will bear a 4 or 6 inch shift; remove a portion of the old soil, and now use the new material in a more lumpy state than in the first potting; the after treatment through the spring and summer in other respects should be the same as the season previous. Attend to training the shoots as they progress; as the plants get strong they will make comparatively lengthened growths that will require the use of either a wire trellis or a number of moderately strong sticks round which to train the shoots; do not tie in the points too closely, or they will have an objectionably formal appearance. After flowering they will again need cutting back; winter them as before and repot in the spring. They may be confined to the same pots, shaking away a portion of the exhausted soil and replacing it with new, or if they are required to be grown into large specimens they can have more root-room given them; so managed they will last for a number of years, and will be much assisted by the use of manure-water during the growing season.

This Plumbago is an excellent plant for training to a conservatory pillar, where if allowed to hang somewhat loosely it has a fine appearance; in such a position it may be either kept in a moderatly large pot, and the soil partially renewed every spring, or it can be planted out. When it is wanted to cover a back wall or a considerable extent of rafter, the most satisfactory method will be to plant it out in a prepared border. This must have the usual sufficient drainage, and should be composed of 8 or 10 inches of good turfy loam with enough sand to keep it open; in planting see that the roots are not allowed to remain in the curved state which the pot has necessarily kept them in—when any plant of this description is turned out in an open border, and the roots are allowed to stay in such a position they do not usually make satisfactory progress. Restrict the quantity of water until the plants have commenced growing freely, after which they will require a good supply both at the roots and overhead by the syringe; attend regularly to stopping and training, especially in the first stages of growth, so as to furnish the space regularly, cutting back every winter to induce the production of young flowering shoots over the whole portion the plants are wanted to cover. When the soil becomes exhausted remove a few inches of the surface each spring, replace it with new, and still further encourage growth by the use of manure-water.

INSECTS.—The plant is somewhat liable to the attacks of red spider, if not sufficiently syringed overhead, but when this is attended to regularly as advised no trouble is likely to be occasioned by it. Aphides will live upon the young shoots, and may be destroyed either by syringing with tobacco-water or by fumigating. Scale sometimes affects it, and is most effectually removed by washing with a strong solution of insecticide when cut back in the winter.

PLUMBAGO ROSEA.

This Plumbago is one of the handsomest winter blooming stove plants that we possess. Individually, the flowers are not unlike those of a miniature Phlox Drummondii, and are produced freely on long, erect terminal spikes from the points of the previous summer's shoots. It is of a somewhat spare branching, erect habit of growth, and furnished with handsome medium-sized leaves. It is not suitable for being formed into permanent bush-like specimens, such as many of the ordinary stove plants, but is better adapted for medium-sized pots to be grown in quantity for autumn and winter blooming, at which season its bright rose-coloured flowers are among the most attractive ornaments of the stove. It is also fitted for training so as to cover an end wall in a light position or for a pillar. The flowers are thin in texture, and unless they have been brought on and matured under the most favourable conditions in close proximity to the glass, they are liable to flag soon after being cut from the plant. It has long been known in this country, having been introduced from Eastern India over a hundred years ago, but it still holds its place as one of a select few winter blooming subjects that have not many equals amongst recent introductions. Coming as it does from the warm parts of India considerable heat is required to grow and flower it well, and, except where an ordinary stove temperature can be maintained in the winter it is not advisable to attempt its cultivation, as without enough warmth the flowering will be deficient; at the same time it is well to bear in mind that this and all other plants that open their flowers during the winter season are better not grown with more heat than is found necessary, for if they are subjected to a temperature higher than requisite the flowers will be of shorter duration on the plant and of less use when cut.

It strikes readily from cuttings which the old plants produce freely if, after blooming, they are kept in a temperature of 60° in the night, and a little warmer during the day; so managed, young shoots will be present in abundance about the beginning of March. Insert them three or four together in 4-inch pots drained and half filled with a mixture of sandy soil, the remainder all sand; keep moist, cover with propagating glasses, and let the temperature be a little above that in which the plants have stood to produce the cuttings. When well rooted move them singly into 3-inch pots, using good ordinary loam with some rotten manure and enough sand to keep the whole porous; pot firmly and do not give much air for a few days until they have begun to root in the new soil, after which inure them to the full air admitted to the house, and place them where they will have plenty of light. Increase the temperature as the sun gets more powerful, and give correspondingly more air in the middle of the day; shade slightly when the sun is very bright, damp overhead with the syringe at the time of shutting the air off, and when some growth has been made cut out the tops of the shoots, removing three or four joints, for if, in stopping this and other similar erect-habited plants that are little disposed to break back, only just the points are pinched off, they often merely break a single shoot; whereas by removing more of the soft top of the shoots two or three breaks will frequently result. By the beginning of June move them into 8 or 9 inch pots, which will be large enough to grow and flower them in the first year. Use soil similar to that advised for the first potting, but a little more lumpy in texture; pot firmly, as with everything of the habit possessed by this plant a loose, insufficiently solidified condition of the soil tends to encourage weak, straggling growth.

During the summer the plants will do with an ordinary stove temperature; although able to bear as much heat as most species from the warmest regions of the eastern hemisphere, 65° in the night will answer, with an increase by day proportionate to the state of the weather. As soon as fairly established in the larger pots stop the shoots again in the manner before advised. All through the summer they will do better in a low pit if it gives plenty of light, as here they can be placed nearer the roof than in an ordinary house. This is important with quick-growing plants like this Plumbago, as under such conditions they make shorter-jointed wood, and have always more roots, both of which materially influence their ability to produce flowers. As the days get shorter cease shading, give more air, and do not syringe overhead; this is necessary to induce a slower formation of growth and to solidify that which has been made through the season. The plants may be divided so that bloom may be had in succession; those intended to come in first should, about the middle of October, be moved into the stove where a night temperature of 60° or over, and a little higher in the daytime, can be kept up. Stand them so that the tops of the shoots will be within a few inches of the roof-glass—the nearer to it the better, if not absolutely touching; if the pots are very full of roots, a little weak manure-water once a week will be an advantage. Give as much air in the middle of fine days as the other occupants of the house will bear, and do not use more atmospheric moisture than needful, as the drier it is within reasonable limits the stouter the flowers will be. The plants intended to succeed the first must not be kept too cool; they should not remain where they will be below 55° by night, or the roots are liable to suffer, in which case the blooms will be weak and small in quantity. After the first crop of flowers produced from the points of the shoots is over, if the plants are strong they will break back and push a second lot from the base of the leaves on the upper portions of the shoots. When the flowering is over give less water to the roots, and keep the plants for a time in a dormant state, after which they may be started into growth in the way already described to produce cuttings, or, if it is desired to grow them on another season, they may as soon as broken into growth have the soil partially shaken from the old balls, be repotted in fresh material, and grown on as in the preceding summer. When required for planting out so as to cover a pillar or wall in the way alluded to at the commencement, these one-year-old plants will best answer the purpose, as if planted, as they necessarily need to be in such situations, at some distance from the glass, newly-struck examples have a tendency to become drawn up and weak. When this Plumbago is to be grown in this way it should be in a position where its head will be able to reach close up to the glass, so as to give strength to the flowers in the way indicated.

Insects.—This plant is not much subject to insects, except where the atmosphere is allowed to become over dry; then red spider will sometimes make its appearance. Thrips and aphides will also live upon it, but the whole of these pests are usually kept away by the daily use of the syringe through the growing season.

PODOLOBIUM.

Evergreen greenhouse shrubs with pea-shaped flowers, produced freely, but the plants are inferior to many of the New Holland genera.

They succeed under similar treatment to Chorozemas, which see.

The undermentioned are the best kinds:

P. berberifolium. Flowers yellow, produced early in spring. A native of Australia.

P. heterophyllum. Flowers yellow, a summer bloomer. From New Holland.

P. trilobatum. Yellow, blooms in spring. A native of New South Wales.

POINSETTIA PULCHERRIMA.

This fine stove species is one of the comparatively few members of the numerous family of Euphorbiaceous plants that are adapted for cultivation under glass. The flowers, strictly speaking, are insignificant, but the crimson-scarlet bracts upon which they immediately rest possess such an intensity of colour, and when the plant is well grown, are so large as to produce an effect scarcely equalled by anything else that we cultivate. Not the least point in its favour is the fact that, in addition to being easily managed, it blooms freely through the autumn and winter months. The flowers, moreover, last very long in perfection, and by treating the plants so as to admit of their blooming in succession, this Poinsettia may be had in flower from November to the end of March. It was introduced from Mexico about the year 1834, and has ever since been a great favourite. Yet though generally cultivated, it is anything but universally well grown, or even grown so well as it was when first introduced. This Poinsettia is naturally erect in habit, yet admits of being treated so as to make a branching specimen, or it may be confined to a single stem,—the form in which it is most useful. It is not necessary to strike cuttings of it so early in spring as required in the case of most other winter-flowering stove subjects, because if they have too long a season of growth they are apt to get taller than many people like them, although this can be in some measure corrected. On the other hand, it does not answer to delay the propagation of it so late as is frequently done, or the plants have not time to attain the strength and solidity requisite to enable them to bear full-sized flowers. If old plants that have bloomed are placed about the beginning of April in a temperature of 65° at night, and proportionately increased by day, they will soon produce cuttings. Like some others of the Euphorbiaceous family, the shoots contain a great quantity of milky sap that renders them unsuited for propagation in the usual manner, that is, from the points of the young shoots severed where the wood has got a little firm. If treated in the way that cuttings ordinarily succeed, very few will root; consequently it is necessary to have them with a heel of the old wood at its juncture with the new growth. Such shoots should be taken off when about 6 or 7 inches in length, and placed singly in small pots part filled with sandy soil, the remainder clean sand. Water slightly, and keep them close and shaded in a striking frame or under propagating glasses in a temperature of 65° or 70°. They will strike in two or three weeks; when well rooted, and they have been inured to the full air of the house, move them into pots two sizes larger, using good loam, to which add one-seventh rotten manure and some sand. Pot firm, shade from the sun so far as necessary to prevent flagging, and do not give more water than is requisite to keep the soil moist. From the time the roots begin to lay hold of the soil let the plants be as much elevated up to the glass as circumstances will permit. It is necessary to be particular about this with a view to correct the natural disposition to grow long-jointed and tall, as nothing in the way of stopping the shoots is of any use with this Poinsettia the first year on account of its inclination to throw all the strength into a single stem. Ordinary stove warmth through the summer, such as given to the majority of heat-requiring plants, will suit it, admitting a fair amount of air in the daytime, and using no more shade than is found necessary to prevent the leaves scorching; damp overhead with the syringe at the time of closing the house. By the middle of July they should be ready for moving into their blooming pots, which may be from 7 to 8 inches in diameter, according to the strength of the plants, use soil similar to that in which they were first potted, and continue to treat as before until the end of August, when gradually give more air and cease syringing; but all through the season do not let the soil get so dry as to cause the leaves to flag, as if this occurs they will fall off before the blooming time, which detracts materially from their appearance.

Keeping them cooler through September will check further growth, and admit of the wood getting matured, but the temperature should not be allowed to fall too low in the nights. If very large heads are wanted, the plants must be kept their full length, which, if they have been well managed and are strong will probably now be 4 feet in height; if smaller heads on dwarfer growth are preferred, the plants should be kept in a growing temperature, and about the end of September the shoots should be half cut through some 8 or 10 inches below the point, leaving them thus half severed for a fortnight. In that time the base of the cut part will get callused over, when they may be cut away altogether, and each of the heads put in a 6-inch pot filled with fine sandy soil. Kept close and moist like ordinary cuttings they will soon root, when they must be kept on growing slowly, and in this way they will produce nice heads of bloom on stems that will not be more than 15 or 18 inches high when in flower, but the bracts will not be near so large as if the plants were left their full length. If some of the stock are kept somewhat cooler, say in a temperature of about 55° until after Christmas, and then removed to a little more warmth, they will come in later and last correspondingly longer. Such of the old plants as are grown on a second year should be cut back to within a few inches of the collar and started about the time advised for the production of cuttings; when they have broken into growth partially shake them out, giving pots a size or two larger. They will make several shoots the second season. They may be kept dwarfer if desired by treating them cooler with more air through the growing season, but, so managed, the heads will be smaller.

There is a variety of the plant with double bracts, that is, the coloured floral leaves are much more numerous than in the ordinary type; it is well worth growing, as also the white-bracted form of the original kind. They all succeed under the same treatment.

INSECTS.—The juices of these plants are too acrid for insects to trouble them much, although aphides will sometimes attack them, and may be destroyed by fumigation.

POLIANTHES TUBEROSA.

(Tuberose.)

Few plants can be had in bloom over so long a portion of the year as Tuberoses. Their perfume is much liked. The climate of this country does not suit them, consequently the bulbs are grown in different parts of the world—Italy, the United States, and Africa—and after being imported and flowered once they are discarded.

To have them in bloom over a lengthened period they should be potted at different times, a portion as soon as the bulbs can be had after they are imported, which is in the latter end of the year; two more pottings should be made at intervals of two months afterwards. Good loam is the best to grow them in, with a little leaf-mould and sand; 6-inch pots are large enough for the largest bulbs; drain well, make the soil moderately firm in the pots, leaving the tops of the bulbs well up above the soil. One of the principal things to attend to in their cultivation is to never let the soil have much water until they have made roots and begun to grow. For early blooming they should be plunged in a bottom heat of from 60° to 70°, the temperature of the house being about 70° in the daytime, with air admitted; give no water until the leaves appear, and keep the soil fairly moist after they begin to grow freely. For later flowering the pots should be stood on a damp bottom, such as the earthen floor of a house, or pit, the moisture from which will be absorbed by the pots and communicated to the soil, so that little water need be given before top growth has commenced. Bring them on in heat, as advised for the earlier lot, so as to give a succession. The plants have a natural disposition to grow tall, and to keep them from being drawn they should have plenty of light; as soon as they have begun to grow away freely keep the flower stems near the glass.

The undermentioned varieties are all good:—

African.
American.
Italian.
The Pearl.

INSECTS.—Aphides are sometimes troublesome, for these fumigate.

POLYGALA.

These handsome and very distinct evergreen greenhouse plants are natives of the Cape, and are deserving of general cultivation, not alone for exhibition purposes, but as ordinary decorative subjects. That they are not more generally grown seems strange, as their colour (bright reddish-purple) is scarce among hardwooded plants, and their appearance is distinct, either in or out of flower, from most things requiring a similarity of temperature and general cultural treatment. They are also of much easier growth than many hard-wooded subjects, not being liable to get out of health or go off suddenly. They are plants that we should recommend to beginners in the cultivation of hardwooded greenhouse species, who sometimes get disheartened by first attempting to grow the most difficult things, which often slip through the fingers of even those who have had long practice, and have patiently studied their peculiar habits and requirements. Polygalas are very free rooters, and not nearly so impatient of slight excess of moisture at the roots as many Cape plants are. They will grow in either loam or fibrous sandy peat, but we prefer peat where it can be had of anything like good quality.

They strike freely from cuttings of the young shoots, about 3 inches long, which may be taken off in spring. Put several together in 6-inch pots filled with sand, keep in a moderate heat, moist, shaded, and covered with a propagating glass; so treated they will root in five or six weeks, after which dispense with the glasses, and move singly into small pots. Keep moderately close, standing them on a moist bottom, give a little shade in the daytime, and as soon as shoot growth begins to move freely pinch out the points. Give more air as they get fully established, and syringe in the afternoons at closing time. Continue this treatment until autumn, when give more air, and winter at about 45° in the nights. Towards March move into 3-inch pots, stop the shoots, and keep the atmosphere a little closer until the roots enter the new soil; treat as in the preceding summer, about July again pinch out the points of the shoots, and stand the plants where they will get plenty of light. Let the autumn and winter management be as advised for the previous year, but about the middle of February shorten the shoots to within three inches of where they were stopped to in the summer, and place them in a house or light pit where they can be kept at a night temperature of 45°; here they will soon break, and by the middle of April will be in a condition for repotting. If they have plenty of roots they should receive a liberal shift—4 inches will not be too much. Break the peat into pieces about the usual size for young hardwooded plants, add a good sprinkling of sand, and make the soil quite firm. At this season the sun is powerful and the air begins to get much drier than earlier, consequently they will require both shade in the middle of the day and the house kept closer, by the absence of side air, for two or three weeks; the stage upon which they stand must also be regularly damped morning and afternoon, and the house closed while the sun is yet upon the glass. At this time the points of the strongest shoots should be brought down low so as to induce a compact bushy condition, with a disposition to clothe the base of the plants well down to the bottom. After they have taken to the new soil, which will be apparent from their young shoots commencing to grow freely, give air as ordinarily, and syringe overhead every evening: get the water well under the leaves and to every part of the plants, so as to keep down spider. By the beginning of July pinch out the points of the shoots, to induce them to break back; attention to this matter is of more importance with Polygalas than most plants, as their natural upright disposition of growth, if not checked, induces a thin, straggling bottom, and, if not stopped in the summer, they will require cutting back in the winter to within the distance already prescribed for the previous year's growth, which is a loss of time by reducing their size. Keep the shoots well spread out, and support them with a few nice sticks, so as to keep the young plants in shape without too much formality. As the pots get filled with roots the wetting of the surface of the ball consequent upon the syringing overhead makes it a little more difficult to ascertain the condition of the soil underneath as to water, and necessitates close observation in this matter: but they must not be allowed to get dry at the bottom of the ball, or growth will be seriously checked and insects encouraged. By the end of August the plants will be benefited by the admission of more air and the absence of shading, so as to harden them up for the winter, during which season keep them in a temperature of 40° or near it in the night. Again, about the end of February, as last season, cut back the shoots to within 6 inches of where they were stopped in summer, and encourage them at once to push young growths by keeping a little closer, as recommended for last spring. Move at the same time as then advised, giving 3 or 4 inch larger pots, according to the strength and condition of the plants; tie them out so as to secure a compact, shapely outline, and keep all the strongest shoots well down—this will have the effect of balancing the growth, which in these, more than in many plants, has a disposition to run up in the centre, leaving the bottom bare. Attend after potting, as advised last season, to shade, moisture, and air, with the regular evening's syringing; and again, by the end of June, stop all the shoots, both strong and weak, back to within 6 inches from the place they were shortened to in the winter. This is necessary, for two reasons—to produce an even head of bloom and ensure that it should all come in at one time, which will not be the case unless the above conditions are complied with. As the end of July approaches give more air for a week or two preparatory to turning them out-of-doors. At the beginning of August place them in the full sun, and screen the sides of the pots from its direct action. Continue to syringe overhead well every dry afternoon. They may remain here until the middle of September, if there is an appearance of fine warm weather, after which it will not be safe to leave them outside. Place for the winter in a good light house near the glass; this, with the hardening process they have gone through, will secure their flowering freely the coming spring, when they will make useful decorative plants for the conservatory, to prepare them for which let them be nicely tied through the winter, using no more sticks than necessary to keep them from having a straggling, untidy appearance. If the object is to get a portion of the plants up to large specimen size as soon as possible, then the strongest should, as heretofore, be cut back in the winter, and not be allowed to flower in the spring; pot at the time before advised, and in every way treat similarly through the season. Such as are allowed to flower must afterwards be cut back again, not leaving more than 6 inches from where stopped to the previous summer. Through all the stages of the existence of these plants it is necessary to stop or cut them back to something near this length, otherwise they get an unsightly naked appearance which destroys the effect of even a full sheet of bloom. Encourage them to break by slightly syringing and keeping a little closer, and when they have pushed a couple of inches of growth they should be moved into pots 3 inches larger —keeping the house a little warmer through the admission of less air for a short time. They should be, as in the previous season, placed for a few weeks in the open air to induce a disposition for flowering. As the plants will now be getting large enough even for exhibition purposes, a minimum temperature of 35° in the night through the winter months will be sufficient; by this means their flowering will be retarded in the spring, which in many cases, where required for exhibition, will be an advantage. Where it is the intention to so use them the tying must be more particularly performed than for home decoration, for unless the plants have sufficient support when they come to be carried any distance, they have a loose, untidy appearance; but instead of the use of a large number of sticks, three-fourths of the branches may be secured in their places by stout black thread.

Polygalas are subjects that bear their blooming retarded much better than some, being stronger in constitution; but where they are to be kept back for any particular time it is well to do it in the early stages of the flower's development. Each season after flowering cut them back as near as already advised, which will cause them to last much longer in a stout, shapely condition. It is not advisable to move them on into pots larger than 18 or 20 inches, as these, with the assistance of weak manure-water during the season of growth, will keep them in condition for several years; but as soon as they get in any way naked and leggy, it is better to consign them to the rubbish-heap, and grow on others to take their places, for which purpose a few young ones should be started every second year.

There are two varieties well worth cultivating.

P. Dalmaisiana is the strongest grower, of the most robust constitution, and its flowers are proportionate in size, and produced freely from the points of the shoots, as with the others. This is the best variety for exhibition, its colour (purple) harmonising or contrasting well with almost any other flower.

P. oppositifolia is more of a reddish-purple in the colour of its blossoms, is very free in growth and flower; it is somewhat weaker in habit, but is a desirable plant, requiring the same treatment as to soil, temperature, stopping, and general routine. It does not generally attain so large a size.

INSECTS.—There is one thing that renders these plants worthy of cultivation —it is their immunity from mildew, the worst pest that the grower has to contend with. Scale, both brown and white, will live upon them; if they get infested with the latter the best thing is to destroy them, as any application that will kill the insect will also kill the leaves. Brown scale can be removed with the sponge and brush, but it is better to deal with after the plants have been cut back when their blooming is over; a good washing with insecticide will then destroy the insects without injuring the plants. They are very subject in the summer to the attacks of red spider, which if not at once removed will in a short time destroy the leaves—in which case the plants are not worth much, as a hard stunted condition, from which they do not easily recover, is induced. A free use of the syringe all through the growing season, while the weather is warm and favourable to the development of the insects, will keep them down, but the water must be directly applied to both the upper and under sides of the leaves where they harbour.

POLYPODIUM.

An extensive genus of Ferns, containing stove, greenhouse, and hardy species, and including many handsome kinds.

For propagation and cultivation, see Ferns, general details of culture.

STOVE SPECIES.

P. Paradisæ. Tropical America.
P. pectinatum. West Indies.
P. plumosum. South America.
P. sanctum. West Indies.

GREENHOUSE SPECIES.

P. effusum. Jamaica.
P. nigrescens. Java.
P. trichoides. Isle of Luzon.

POLYSTICHUM.

A genus of Ferns comprising stove, greenhouse, and hardy species; most of the kinds included in it hold only a secondary position in their appearance, but should be present in collections where the object is to include as many distinct forms as possible. The greenhouse section will usually be found most desirable.

For propagation and cultivation, see Ferns, general details of culture.

GREENHOUSE SPECIES.

P. denticulatum. Jamaica.
P. ordinatum. Chili.
P. proliferum. Tasmania.
P. pungens. Cape of Good Hope.
P. triangulare. Jamaica.
P. vestitum. New Zealand.

PORTLANDIA.

This is a limited genus of evergreen stove shrubs, only a few being known to cultivators. The appearance of the plants even when not in flower is such as to make them worth growing, and their flowers are handsome and distinct-looking. They require a high temperature, otherwise they make slow progress.

Their method of propagation and general treatment is like to that recommended for Ixoras, which see.

P. coccinea. A fine species, with handsome foliage, and striking red flowers, which open in summer. It comes from Jamaica.

P. grandiflora. Much the finest of the genus in regard to the size it attains, the character of the foliage, and also the appearance of the flowers, which are white, produced in summer, and the largest of any of the species. From Jamaica.

P. platantha. This is from South America; like the last-named it bears white flowers in summer. It is a smaller grower than P. grandiflora, but where that is cultivated there will scarcely be occasion for this.

INSECTS.—The high temperature the plants require favours the presence of insects, all of which that usually affect stove plants are troublesome on Portlandias. A free use of the syringe daily during the growing season will keep down the less injurious kinds. Mealy bug and scale may be got rid of by spunging in summer, and copious washings with insecticide in autumn and winter.

POSOQUERIA.

These pretty evergreen stove shrubs bear handsome very long-tubed flowers individually not unlike those of the Stephanotis. The two species most deserving of cultivation, P. longiflora and P. multiflora, are both natives of Guiana, and succeed best when grown in a moderately high temperature. They strike well in spring from cuttings made of the young shoots consisting of three or four joints. They should be placed in sand, in a temperature of 70°, kept close and shaded. Under such conditions they will be rooted sufficiently in two months to require shifting into 4-inch pots. They do best in peat, to which a moderate quantity of sand is added. Place them in a light position near the glass; this is necessary, otherwise their natural inclination to grow thin and straggling is increased. Pinch out the points of the shoots when they have made a few inches of growth. A temperature during summer of 65° to 70° at night will not be too much with proportionately more heat in the daytime; tie out the shoots as they grow, so as to lay the foundation of bushy specimens.

By the middle of August they should have made sufficient progress to require shifting into 6-inch or 7-inch pots, after which encourage them to make growth, so that their roots may get well hold of the soil before the short days necessitate a reduction of the temperature. During the growing season syringe overhead daily, but discontinue this, and also shading, by the middle of September; after that time gradually reduce the heat to 60° at night and keep them correspondingly cooler by day; continue in this way throughout the winter, giving them less water at the roots, but yet not allowing the soil to get so dry as to cause the leaves to flag.

In spring raise the temperature, and move them into pots 3 or 4 inches larger than those they are in; treat them in other respects as in the previous summer. They may be expected to bloom about midsummer, and, in addition to their handsome appearance, will give an agreeable perfume to the house.

After they have done flowering, shorten the shoots and encourage them to make growth before autumn; to help this manure-water should be given once a week until the middle of September. Treat through the winter as before, and in spring turn them out of their pots, remove a little of the old soil from the top of the balls, and give pots 2 or 3 inches larger. Apply more heat as the summer advances. This second season they will have grown large enough to produce a fine head of bloom; when they have done flowering, again shorten the shoots and treat in other respects as hitherto recommended. The plants will last for several years if the soil is partially renewed each spring when they are potted; and they are assisted through the active season of growth with manure-water.

Insects.—Posoquerias are liable to be affected by most of the insects that attack stove plants. These must be kept in check by freely syringing with tepid water, which will be sufficient to remove all except mealy bug and scale; should these pests appear dip in or syringe with insecticide.

POTHOS.

These are distinct-looking stove plants that emit roots from the stem, and like Ivy, attach them to anything they can lay hold of. They are useful for covering walls, and are easily grown. All that is necessary is to take off pieces of the shoots and place them singly in pots—this may be done at any time of the year, but best in spring; they should be kept moderately close and moist, until the roots lay hold of the soil, after which grow on in a medium stove heat until the shoots have made considerable progress, when they may be planted out in a bed or removed to large pots. They are moderately strong growers, and if confined to pots must not be pinched for room.

P. argyræa. A well-known, free-growing kind, with handsome foliage. It comes from the West Indies.

P. argyræa macrophylla. A distinct-looking form of P. argyreæa; an equally free vigorous grower.

P. aurea. A distinct and handsome species; the leaves are a combination of deep and light green, with large pale yellow blotches. It comes from the Solomon Islands.

P. flexuosa. A new species, with habit much like that of Marcgravia, the leaves alternating from right to left, they are about 6 inches in length, oblong-acuminate, pale green in colour, and lay quite flat on the surface to which the stems attach themselves. From India.

Insects.—A good syringing daily through the growing season will usually keep them free from the attacks of the different kinds of insects; but, if this is not found sufficient, sponging will be the safest remedy, as the succulent character of the leaves is such that they do not well bear the application of insecticide.

PRATIA.

These are greenhouse herbaceous plants of a somewhat interesting character. They are of moderate growth, and flower freely if grown in a good light house. They are increased by division of the roots in spring before growth begins; if the portions taken off the parent plants are large enough they may at once be placed in good-sized pots, tying the shoots as they advance to sticks for support.

P. begoniæfolia. Has blue flowers; it blooms in the summer, and comes from Nepal.

P. corymbosa. Flowers white, produced in summer. From the Cape of Good Hope.

P. littoralis. A summer bloomer, the best of the genus.

Insects.—Both aphides and red spider are partial to these plants; for the destruction of the former fumigate, and use the syringe regularly in summer to keep down the spider

PRIMULA.

Few plants are more useful for greenhouse decoration than the Chinese Primulas, of which there are now so many fine varieties, single and double. If required the single kinds alone will furnish flowers the whole year round, seed being put in at different times so as to produce bloom in succession. But it is for winter flowering that these plants are most acceptable. Young plants are the best, the old ones should be discarded each year after they have bloomed, and others brought on regularly to take their place.

To get the plants strong for autumn flowering some seed should be sown early in March; at this time a large shallow pan should be drained and filled with fine sifted loam, to which is added some leaf-mould and sand; press the soil smooth, and slightly water the surface to close up any holes wherein the seed might get too deep. Allow a day for the soil to dry, and then sow the seeds, not too thickly, covering very slightly, and again pressing the surface smooth. Place a piece of thin white paper over the top to prevent the soil drying, so that no water need be given until the plants are up; stand in a temperature of 50°. As soon as the seeds vegetate remove the paper and put near the glass so as to prevent the young plants being in any way drawn up weakly. Shade slightly when the sun is bright, giving when required just enough water to moisten the soil, but not to make it too wet. Admit air in the day, and when the little plants are an inch high prick them off 3 or 4 inches apart in shallow boxes, drained and filled with soil such as the seed was sown in; place the boxes close to the glass, and keep the night temperature similar to that in which the seeds were sown, allowing it to rise with some air on in the daytime proportionate with the now increasing sun heat. Shade a little when the sun comes on the plants, and give water as the soil gets dry. Treat in this way until the end of May, when they will do best in a cold frame stood facing northwards in an open situation; plenty of air should now be given with a thin shade in sunny weather. By the middle of June the plants must be moved to 5-inch pots. The soil should now have some good rotten manure mixed with it in addition to the leaf-mould and sand, drain the pots moderately and move the plants with as little disturbance of the roots as possible; pot moderately firm and return to the frames, which should now be half filled with fine ashes to raise the plants up near the glass so as to keep them stout, as if Primulas ever get drawn they are half spoiled; to prevent this they must never be stood too close together. After potting keep the frame a little close for a few days, then give plenty of air in the day with some on at night as well; keep the ashes on which the pots stand damp, and give water to the plants when required. If the lights are drawn off altogether in the nights, and replaced by day, the dew will benefit the plants, and as the pots get full of roots give manure-water once or twice a week. In most cases 5 or 6 inch pots will be large enough to flower the plants in, but if it is thought desirable to grow some on bigger they may be moved to pots a size or two larger towards the end of August. After this time no more shade should be necessary. Before there is danger of frost move them to a house or pit where they can be stood well up to the glass. Up to this time it will be well to pinch out all flower-stems produced as soon as they are visible—this will have the effect of strengthening the plants, and enabling them to bloom better when required later on. During the flowering and through the winter they will bloom better in a temperature of 45° than if colder, and care should be taken during the dark dull weather not to wet the foliage, or to give more water than is necessary: neglect in either of these matters tends to cause the plants to damp off—a complaint to which Primulas are subject in winter, especially when in too low a temperature, or stood far from the glass. A successional sowing should be made about the beginning of May to flower later on in winter and spring after the earliest are over.

The double kinds of Primula, the flowers of which last longer than those of the single varieties, are increased by cuttings made of the side shoots, which, when well managed, the plants produce freely. The cuttings may be put in any time during the spring or summer; they should be cut away from the parent plants with as much stem as obtainable, and put singly in pots, only large enough to hold them, filled with fine loam, to which a good portion of sand has been added. No more water should be given than is needful, or the cuttings will be liable to rot; if they are put in early in spring when the weather is cold the temperature of the house should be kept up by fire-heat to 50° or 55°, and they should be kept moderately, but not too close, as overmuch confinement will also cause decay. When enough roots are formed to support the plants from flagging, gradually give more air, and stand them where they will get plenty of light; as soon as the little pots are full of roots move into others an inch or two larger, using soil like that advised for the single kinds. A good light house or pit is better suited for the growth of this section of Primulas than frames such as recommended for the single sorts. The general treatment required through the summer in the matters of soil, air, water, and shade is similar to that needed by the single varieties. Consequently, all further that is necessary is to move the plants on into larger pots when those they are now in get fairly filled with roots. When the weather becomes cold in autumn the double sorts should be placed where they can have a little more warmth—from 45° to 50° in the night is not too much, and be stood near the glass. In a low temperature it is scarcely possible to avoid many going off by damping, as a further precaution against which the soil should be kept raised right up to the foot of the stalks of the lower leaves.

The single Primulas have been so much improved in recent years, that all needful is to secure good strains of the white, red, and purple forms. Of double kinds there are several sorts of white, pink, and red, that afford enough variety for all purposes.

P. japonica. Makes a useful pot plant for greenhouse or conservatory decoration. It is easily raised from seed.

P. Sieboldii (cortusoides amœna). This is a beautiful species of which there are many forms, varying in colour from white to pink, lavender, red, and crimson. These are nearly hardy, and are charming plants for greenhouse decoration, for which they should be kept in pots, plunged and protected in frames through the winter. They are increased by division of the crowns, potted and grown on in cold frames.

INSECTS.—Aphides are almost the only insects that affect Primulas; the best method of destroying them is by fumigation with tobacco.

PRITCHARDIA.

A beautiful genus of stove Palms, so distinct in appearance that they should find a place everywhere where large fine-leaved plants are grown.

For propagation and cultivation, see Palms, general details of culture.

P. Martii. A handsome species with massive, deeply-plaited leaves. From the South Sea Islands.

P. pacifica. A noble plant with very large palmatisect, plaited leaves, that recurve considerably at their outer edge. It is manageable in size so that it can be accommodated in an ordinary-sized house. From the Polynesian Islands.

PRONAYA ELEGANS.

An evergreen plant from the Swan River with blue or lilac flowers, produced in summer. It is not very attractive or much grown, but it can be used as a roof-climber.

It can be raised from seeds sown in spring, or shoot cuttings put in at the same season, treated in the ordinary way in a temperature of 65°; pot on when rooted and keep in a medium heat until midsummer, when give more air, and treat as required for the generality of greenhouse species. Winter at about 45°, and in spring give more pot-room. The plant is a moderate grower, and does best in good fibrous peat, with some sand; through the summer give such treatment as is required by other Australian plants, with plenty of light and air. The spring following turn out in the border where they are to be grown, and train the shoots as they extend.

INSECTS.—Red spider is often troublesome, unless the syringe is kept regularly in use through the growing season. It is also more subject to aphides than most plants of like description, and must be frequently fumigated, or the young leaves get crippled.

PROSTANTHERA.

Evergreen greenhouse flowering shrubs, not much valued at the present day. They thrive under treatment such as advised for Chorozemas, which see.

The following are the best of the genus:

P. lasianthos. Is a summer bloomer; it bears purple flowers, and comes from New South Wales.

P. linearis. Also a summer bloomer, with purple flowers, from New South Wales.

PSYCHOTRIA JASMINIFLORA.

This plant, usually known as Gloneria jasminiflora, is of comparatively recent introduction, and is well worth a place. It is an evergreen species of neat growth, requiring stove heat. The flowers are white, borne at the points of the shoots in bunches, like those of a Bouvardia. It blooms in spring.

Its mode of propagation, and the general culture required, are such as advised for Jasminums, which see. It comes from Brazil.

INSECTS.—Scale and mealy bug are often troublesome on the plant, and must be kept under by frequent dippings and washing with insecticide.

PTERIS.

A genus of pretty Ferns, including stove, greenhouse, and hardy species. Many of them are of elegant habit, and especially adapted for decorative use in combination with other plants, as also in a cut state for mixing with flowers. Variegation of a decided character is rare among Ferns, but it is found in Pteris more distinct than in others—for example, the beautiful little P. tricolor, with P. Argyrœa and P. cretica albo-lineata.

For propagation and cultivation, see Ferns, general details of culture.

STOVE SPECIES.

P. aspericaulis. East Indies.
P. nemoralis variegata. Bourbon.
P. rubricaulis.
P. tricolor. Malacca.

GREENHOUSE SPECIES.

P. argyrœa. East Indies.
P. cretica. Candia.
P. cretica albo-lineata. Java.
P. hastata. South Africa.
P. scaberula. New Zealand.
P. serrulata. India.
P. serrulata Applebyana.
P. serrulata cristata. Japan.
P. serrulata cristata lacerata.
P. serrulata Dixonii.
P. serrulata Leyii.
P. umbrosa. Australia.

PTYCHOSPERMA.

A genus of greenhouse Palms, few in number but remarkable for their elegant appearance. When they have attained a medium size they rank among the most stately objects that can be introduced to a conservatory; what is still more in their favour is their ability to thrive with much less warmth than most Palms.

For propagation and cultivation, see Palms, general details of culture.

P. Alexandræ. A handsome species, in either a small or mature state. The leaves are pinnate, the pinnæ droop slightly, which combined with the evenly arched form of the entire leaf gives the plant a plume-like appearance, such as is not surpassed by any in cultivation. From Queensland.

P. Cunninghamii (syn: Seaforthia elegans). In general appearance this is so like P. Alexandræ that an intimate acquaintance with the two plants is necessary to distinguish one from the other. The young leaves of this kind have not the reddish-brown tint that is present in P. Alexandræ, but in other respects they are so near alike that it is not necessary to include both in the same collection. New Holland.

P. rupicola. A stately, distinct-looking species, with broad pinnate leaves, the pinnæ much wider than in the last-named kinds. A native of Ceylon.

PULTENÆA.

An extensive genus of low-growing evergreen greenhouse shrubs, with great sameness in the flowers, as most of the species are yellow.

They succeed with treatment such as given for Boronias, which see.

The undermentioned are the most desirable:—

P. cordata. Flowers yellow, produced in spring. A native of Van Dieman's Land.

P. elliptica. Yellow; a spring bloomer. From New Holland.

P. ericoides. Yellow and red; also a spring bloomer. Swan River.

REIDIA GLAUCESCENS.

An elegant and very singular stove plant, with erect habit of growth like that of most of the Aralias. In general appearance the leaves are like those of some of the Mimosas. The flowers, which in themselves are insignificant, are produced singly, one to each of the leaflets, giving the plant a most remarkable appearance. It is best adapted for confining to a small state, such as in 5 or 6 inch pots, for table decoration.

It is increased by cuttings, and grown on afterwards in the way advised for stove Aralias, requiring heat like them, which see. A native of Java.

RESEDA ODORATA.

(Mignonette.)

This fragrant flower is everywhere a favourite.

It is easily raised from seed sown at different times in the year, according to the season it is wanted to flower. It is most acceptable in winter. There are different ways of treating it so as to have it in bloom during the dull season; either by growing several small plants in 6-inch pots or by large examples grown singly in good-sized pots, usually described as tree Mignonette. To have the latter in good condition the seeds should be sown in spring, three or four together in 3 or 4 inch pots, in good loam, with a little manure and sand added. Stand in a frame, and when the plants are up thin them out to one; if to be grown tree fashion these must have all the side shoots pinched off as they appear, and a stick should be put in the soil to support each. When the pots are fairly full of roots move into others 7 or 8 inches in diameter, keeping the side growths removed until the leader is 18 or 20 inches high, when pinch out the point so as to cause shoots to break that will form a head. During this time ordinary greenhouse treatment is all that is needful, give plenty of light and air, with water to the roots as required, and syringe overhead in the evenings. Stop the shoots two or three times through the summer, keep the flowers picked off, and put a stick to the stem sufficient for support. If the plants are required large they should be moved into 10 or 12 inch pots when those they occupy are full of roots, but much may be done to produce large plants with comparatively little root-room if manure-water is given freely when the soil is filled with roots. If bush-shaped plants are preferred stop the leading shoot when about 4 inches high, and again, later on, giving the requisite supports to keep the shoots well opened out so as to admit light to the centre of the plants and secure the desired shape. To flower in winter in small pots, which in most cases will be found the most convenient way, the seeds should be sown early in August; stand the pots in a frame, directly the little plants appear give plenty of air by drawing the lights off when there is no likelihood of excessive rains, giving water when the soil seems to require it. Four or five plants are enough to grow in a 6-inch pot, and a small stick should be put to each so as to keep them erect. Before there is danger of frost move the plants to a pit, or the shelf of a greenhouse, where they will be close to the glass, and admit air freely, with an ordinary greenhouse temperature. Another sowing should be made in September to flower in spring, manage them as advised for the earliest set of plants; winter near the glass, with plenty of air to prevent them from being drawn.

INSECTS.—Aphides are often troublesome on Mignonette, and if allowed to remain long undisturbed will spoil the plants. As soon as present they should be destroyed by fumigation.

RHAPIS.

This genus of greenhouse Palms consists of few species, one at least of which, R. flabelliformis, is second to none for its usefulness where slender-growing elegant plants are required.

Propagation and cultivation given under Palms, general details of culture.

R. flabelliformis. A pretty, thin-stemmed species, with small fan-shaped leaves deeply divided. Like many other Palms, in the early stages of the plant's existence the leaves do not show their true character, but it is always effective, and the foliage is so stout in texture and naturally so enduring that it bears much hard usage. From China.

R. flabelliformis variegata. A prettily variegated form of the preceding, deservedly much prized by lovers of variegated foliaged plants.

RHODODENDRON.

The kinds of Rhododendron that will thrive under greenhouse treatment are now numerous; among them are several species, such as the magnificent R. Nuttallii from Bootan, which attains a height of 20 or 30 feet, R. Gibsonii, a compact bushy habited sort from Khoseea, R. arboreum, from Nepal, R. Dalhousianum, from the Himalaya, R. jasminiflorum, from Malacca, and R. javanicum, a Java species, from which have sprung the large number of beautiful hybrids, now coming so largely into use for conservatory decoration. The free-growing habit of these hybrids, and their equally free disposition to flower—often two or three times in the year—combined with the beauty of their flowers go to rank them with the most desirable plants for the decoration of cool houses. The hybrid varieties possess a much better habit than R. javanicum, which is a determined spare erect grower, not disposed to branch out.

The mode of propagation best suited to the hybrid sorts is grafting on such of the seedling varieties as possess a free vigorous constitution. The stocks require to be raised from shoot cuttings in the ordinary way, and grown on in 6 or 8 inch pots until large enough for grafting, when they must be headed down to within 5 or 6 inches of the pots, and the grafts, which should consist of pieces of the preceding year's shoots, inserted. The work ought to be done in the winter, and after grafting the plants should be placed in sufficient warmth to start them into growth; when some progress has been made the points of the shoots must be pinched out to induce the lower eyes to break so as to furnish the plants with side branches. After this the treatment is simple, merely giving pot-room as required.

Rhododendron Veitchi.

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These Rhododendrons do not want so much root-space as many things. It will be well to keep the plants altogether under glass for two years, giving ordinary greenhouse treatment, after the grafts have got a good start in the warmth already advised, this is requisite to get them on in size. Afterwards they will be better out-of-doors in the summer. They do best in good turfy peat, to which add some sand. Large growing kinds like R. Nuttalli, as they get big enough to require it, must have large boxes or tubs to grow in, or better still, be planted out.

The undermentioned are desirable sorts:

R. Countess of Haddington. Blush white.

R. Countess of Sefton. White and rose.

R. Dennisonii. White and lemon; very fragrant.

R. Duchess of Edinburgh. Bright orange scarlet.

R. Duchess of Sutherland. White, flowers fringed.

R. Duchess of Teck. Yellow, tinted with scarlet and rose.

R. Lady Skelmersdale. Pure white.

R. Maiden's Blush. Blush white.

R. Pink Beauty. White and pink.

R. Princess Alexandra. Pure waxy white.

R. Princess Alice. White, tinged with pink; fragrant.

R. Princess Royal. Rose colour.

R. Prince of Wales. Orange red.

R. Purity. Pure white; very fragrant.

R. Rosy Gem. White, pink, and rose.

R. Taylorii. Pink.

R. Thomsonii. Scarlet.

R. Veitchianum. Yellow and white.

The following species are fine kinds:

R. arboreum. Scarlet. Nepal.

R. argenteum. White, with black spots. Himalaya.

R. Aucklandii. White. Himalaya.

R. Dalhousianum. White. Himalaya.

R. Falconerii. Red and white. Himalaya.

R. Fortunii. White. China.

R. Gibsonii. White. Khoseea.

R. jasminiflorum. White. Malacca.

R. javanicum. Yellow. Java.

R. Nuttallii. White and yellow. Bootan.

INSECTS.—Rhododendrons are not much subject to the attacks of insects, but grown under glass they frequently get affected with scale or mealy bug, for which syringe freely with water, and sponge with soap and water.

RHOPALA.

In their native habitats these plants assume the proportions of trees, and in a comparatively small state they are very effective for the decoration of greenhouses or conservatories. Their foliage is distinct and handsome, in some of the species almost resembling that of Palms.

They are increased by cuttings made from three parts matured shoots cut in lengths of a couple of joints each, discarding the soft extremities; they should be put four or five together in 5 or 6 inch pots half filled with sand and loam, the remainder all sand. The cuttings may be put in about August, when the wood will usually be found in right condition; place them in a temperature of 65° or 70°, where they will strike in two months if kept covered with a propagating glass, moist, and shaded. When well rooted move singly into 3 or 4 inch pots filled with loam to which add some sand, and keep them through the winter in an ordinary stove temperature; here they will make some progress in top growth, which it is necessary should be kept moving. In the spring pots two or three sizes larger will be required, and soil similar to that in which they were previously potted should be used. Keep through the summer in an intermediate or stove temperature, standing them where they will get plenty of light, with air in the day and a little shade in bright weather. The temperature the plants are kept in is not material, as they will grow in a greenhouse, but it is better this first summer to keep them as advised in a moderately high temperature, as by this means time is saved, and the growth will be more pleasing in appearance. All that is required is to attend to them with water, syringing overhead daily through the season until autumn, when discontinue it. But if the plants can be accommodated with warmer quarters than that of a greenhouse during the winter and through the ensuing summer much more progress will be made, and they should be given pots a couple of sizes larger in the spring, and treated as advised for the summer previous. After this they will do in a greenhouse or conservatory, where their stately erect growth—they should be confined to a single stem—will be effective. The plants will not get too tall for a moderate-sized house for three or four years, and will simply require more root-room each spring. When too large they may be headed down before the season's growth commences, and should be stood for a time in heat if possible to help their breaking, after which they may be turned out of the pots, some of the old soil shaken away and replaced with new.

The undermentioned are desirable kinds:

R. corcovadensis. A large-leaved, distinct-looking plant, with foliage of great substance. A fine kind. Brazil.

R. crenata. A distinct and handsome free-growing variety.

R. Jonghei. Similar in habit to R. corcovadensis, but with bigger leaves. Brazil.

R. Porteana. A handsome kind.

INSECTS.—The juices of these Rhopalas seem to be proof against insects, except mealy bug, which can easily be kept down by syringing.

RICHARDIA (CALLA).

For the distinct and elegant form of their flowers, as for their bold, handsome leaves, these greenhouse plants are alike remarkable; the ease with which they can be grown still further enhances their merits. The pure white trumpet-shaped flowers of R. æthiopica are equally attractive when used for filling large vases as they are when growing on the plant. In addition to their merits as cool greenhouse plants they bear forcing well, so that with a sufficient supply and means for bringing them on in heat they can be had in flower from the beginning of the year until far on in summer. The common white species may be termed an aquatic, and it will live and flower out-of-doors in a small pond or tank of water, sufficiently deep to prevent the roots being frozen.

Callas are best increased from the suckers which they produce freely; these should be taken off in the spring before growth commences and put singly in from 3 to 6 inch pots, according to their size. They grow well in ordinary loam to which has been added a moderate quantity of sand. As soon as potted they should be stood in a house or pit—if with a little warmth they will move into growth quicker; give plenty of water to keep the soil well moistened, and when they begin to move freely stand where they will be under the influence of full light. Do not shade even in the brightest weather unless the leaves are found to be scorched, as the stouter and shorter they are the better. About the end of June give pots a size or two larger, in which they will complete their growth and flower—standing out-of-doors from the latter end of August until there is danger of frost will benefit them by helping to mature the growth, on which their free blooming depends. The strongest plants may be had in flower at Christmas by placing them in moderate heat six weeks before; stand well up to the glass, and do not let the roots want for water. They may be grown to a large size in the course of three or four years, so as to fill 12 or 15 inch pots if required, by annually moving them on, but moderate-sized examples consisting of two or three crowns in 8 or 10 inch pots are generally preferable.

A still better way where the means exist is in the spring to turn them out of the pots, divide the crowns, and plant them in the open ground in rows, a foot apart, with a little more room between the rows, choosing an open situation; here they will grow very strong if well supplied with water through the summer. About the middle of September take up and put in pots just big enough to hold their roots without undue pressure; so treated they make short leaf-stalks and look better when in flower, but plants that have been managed in this way are not usually so good for the earliest forcing as such as have been grown in pots altogether, therefore it is better to keep the outdoor-grown stock for later flowering.

The undermentioned are well deserving of a place in every greenhouse:—

R. albo-maculata. Leaves spotted with white; a pretty variety. Africa.

R. æthiopica. The best for greenhouse use. It comes from the Cape of Good Hope.

R. hastata. A yellow-flowered kind of moderate growth, deserving of a place.

R. melanoleuca. A pretty kind, similar in habit to R. albo-maculata; the leaves are spotted with white, the spathes yellow, with a bold blackish-purple spot at the base. A South African species.

INSECTS.—Richardias are not much subject to insects except aphides, which often infest the leaves and flowers; if these appear fumigate with tobacco.

ROELLA CILIATA.

This is a native of the Cape; it has long been grown in a few collections of hard-wooded greenhouse plants, but from its very distinct general habit, and the uncommon colour of its flowers, it seems strange that it has not been more frequently met with, especially as used for general decoration—its flowers, from their very unusual colour, associating well with almost any other plants. It is a free grower, but requires to be carefully looked after in respect to mildew, to which it is very subject, particularly in the winter season, if kept in too low a temperature; in fact, to attempt to winter it in a chilly, damp atmosphere is to court almost certain destruction. There is one peculiarity natural to this plant that some persons object to—its very small leaves are produced in tufts upon the weak, thread-like shoots, and to each little bunch is one, a sort of guard-leaf, much longer than the rest, which while still young, and a full year or more before the others decay, turns brown, but is still retained upon the plant —giving it a rusty appearance; and if the plant is ill-grown, or kept too cold through the winter, this rusty appearance is increased. When, however, a well-flowered example is met with, its remarkable white, bluish-purple-tipped blossoms, covering the surface almost so as to touch each other, effectually hide any brown appearance the foliage may have.

The plant never attains a size that renders it unsuited for growing, even where the room at command is limited. To grow it well good fibrous peat with one-sixth of sand added is required. It is a free-rooting subject, much more so than its general appearance would lead one to suppose.

The method of propagation is by shoot cuttings. If put in towards the end of March, select such as are strong and about two inches in length, and put several together in 6-inch pots in sand; keep moist, with shade when the sun is on the glass, and moderately, but not too close in an intermediate temperature. They will soon root, when give more air, and as soon as they are sufficiently established move singly into pots about 2 inches in diameter, using fine peat with a good sprinkling of sand. Directly the little plants begin to move freely pinch out the points of the shoots; keep through the summer near the light, stood on a moist bottom, with shade from the sun, and a moderate amount of air in the daytime. Under such conditions they will progress, and may require towards the end of summer the points to be again pinched out. Winter at about 45° or 50°, and early in March move into 4-inch pots, using soil as before advised; a little after this, when they begin to move faster, again pinch out the points of the strongest shoots. As the weather gets brighter give shade, and moisten the material on which the pots are stood at closing time daily, but admit more air in the day than required the preceding summer. By the beginning of July give 6-inch pots, and tie the strongest shoots out to small sticks; continue similar conditions of shade, air, and moisture until the middle of September, when give more air with a drier atmosphere. Now winter at about 45°, and again towards the beginning of March move them into pots 2 inches larger, giving 2 inches of drainage, and pot firmly, placing to them at the same time sufficient sticks for their support, running the sticks as far as possible into the new soil so as not to injure the roots.

The plant will flower in even the smallest state, but while young the flowers should be removed as soon as formed. This will be all that is now required in the shape of stopping, as it is a very even grower, not often making any over-strong shoots, but if such should appear they must be shortened back. Admit no side air for two or three weeks, shade a little when very bright, and keep the stage on which they stand damped during sunny weather, but do not syringe overhead. The plants, if all goes well, will quickly take to the new soil. Attend to them properly with water, but on no account give it before it is required, as this, in common with most hardwooded plants indigenous to the Cape, is impatient of too much moisture at the roots. Keep in a good airy house or pit near the glass, for it is especially a light-loving subject, that will not do well if crowded or shaded by other plants. Close the house early in the afternoon while the sun is on the glass, during the spring months; through the summer admit plenty of air in the daytime, and continue to damp the stages and sides of the pots when the house is closed, but do not wet the plants overhead, for they are in no way benefited thereby, and the effect of water on the young growth is to render it more liable to mildew.

By the beginning of July some of the strongest plants may probably have so far filled the pots with roots as to warrant a second potting; but in the case of any except the strongest it will not be required, and had better not be attempted, for if the roots do not exist in sufficient numbers, so as to enter this new soil in quantity before winter, it is apt to get sour, thereby inducing an unhealthy condition from which few plants will recover. Give the most vigorous a 2-inch shift, using, as before, good peat, with a similar proportion of sand, as advised for the early potting. By August they will most likely set flowers upon the points of all the shoots; these, as soon as formed, should be picked off. By the end of August discontinue early closing, and leave air on in the night during the succeeding month to ripen up the growth. Keep them moderately cool through the autumn, during which the house must be closed in the night, or the plants may get chilled. Most likely they will again show bloom, which must be picked off, or it would come in at a time when of little use, and interfere with the next season's growth. They must be wintered at the warmest end of the hardwooded house, if there is not other accommodation for them; but they will do much better if they can be placed where they can receive from 40° to 45° in the night, until the temperature is brought up to that by solar heat, as this Roella cannot bear without injury so low a temperature as many plants indigenous to the same country. Tie out nicely, so as to keep their branches in the required position, for it is naturally procumbent in growth, and if not tied up it will lie over the pot so as to receive injury and have an unsightly appearance. Again, about the beginning of March, repot; the strongest will bear moving into pots 3 inches larger; to such as are weaker do not give more than a couple of inches more room. Now, as the plants get stronger, use the soil a little more lumpy—it will do broken about the size of walnuts. As before, tie the branches out to the rim of the pot; after potting treat as in the preceding season as to water, keeping the house for a few weeks a little closer, until the roots have begun to take to the soil, and closing with sun-heat and moisture.

It is now time to decide what is to be done with the plants in regard to allowing all or a portion to flower. If the whole are grown simply for decorative purposes, then it is best to allow them to bloom, which they will do freely from the points of every shoot. If some are required to be grown on larger, these should again have their flowers removed as soon as they are formed. Those that are allowed to flower may, when in bloom, be removed to the conservatory, and placed where they will receive plenty of light and not be overcrowded; as soon as they have done flowering move them back to the hardwooded house, and pick all the old flowers off. This is a matter of the greatest importance with this plant at all times, but more especially if they are allowed to open any during the autumn or winter; for if not immediately removed after they have decayed, they begin to mould, and will kill almost every shoot right back as far as the season's growth, and very often destroy the plant. This is a singular peculiarity to which this Roella is subject under cultivation; no doubt owing to the natural condition of the wood not being calculated to resist the effects produced by the confined atmosphere of a plant-house, which causes the flowers after they have closed to become mouldy.

After blooming, grow them on with the others that have not been allowed to flower, treating them as in the preceding season in every way, except that none will this season require another pot. As autumn approaches, again give more air, day and night, so as to mature the wood; but not even when they get large must they be fully exposed to the open air, as the plant does not well bear such treatment, exposure only aggravating the rusty appearance of the leaves, without being of any benefit.

A full crop of flowers will no doubt be again formed this autumn, and should be removed; winter the plants in a temperature similar to such as recommended the previous season, near the glass in a light house. In the spring, about the same time as heretofore, move again, giving them pots, as before, 3 inches larger, which is as large a shift as this plant ever requires. After they are potted, give the same treatment as advised for the preceding seasons; they will this year make nice young flowering specimens, and may be allowed to bloom either for conservatory decoration or for exhibition if required, where the plants, from their uncommon colour, are always effective. If wanted for showing later in the season, say about August, they will, if all the flowers are taken off in the spring, set a second crop later on, which will come in about the time indicated. Through the autumn and winter keep as in the past years, tying them nicely into shape; pot as before, and at a similar time in the spring. This season, if all has gone well with them, they will be large enough to exhibit in any collection of plants, if they are required for such purpose; and for the time to come let the general routine of their culture be similar to that which has been advised through the early stages of their existence.

INSECTS.—In the cultivation of this plant one of the principal things to be guarded against is mildew. Whenever this makes its appearance sulphur should at once be applied. The plant is little subject to the attacks of insects. If it stands so as to touch others that are affected with brown scale, or under a plant upon which this insect exists, it will get upon it, but does not increase fast, and it can be easily kept down by going over the plant with a small brush at times. This is the only insect we have ever seen it troubled with.

ROGIERA.

These handsome cool stove plants have never been so much grown as the beauty of their flowers warrants, and where their cultivation has been attempted it has often happened that they have bloomed indifferently. This may generally, we think, be traced to their having been grown in too much heat, or to their roots being confined, as they do not succeed so well in pots as when planted out. They are hardwooded evergreen shrubs. Their flowers are borne in bunches, in form not unlike those of a Rondeletia. Their propagation is by cuttings, which strike best when made of shoots produced from branches that have been cut back, taking the young growths off with a heel in spring as soon as large enough. These we have found to root much better than cuttings made of ordinary shoots. They do best put singly in little pots filled with sand, kept moist, close, and shaded. When they are well rooted and sufficiently hardened pot in sandy peat. A temperature of 60° in the night is enough for them during the summer, with a proportionate rise by day. Syringe overhead daily, allowing them plenty of light, with a little shade in very bright weather, and more air than the generality of stove plants require.

By the middle of July move them into 6-inch pots, using good peat. During this time they will need the points of the shoots pinched out, otherwise they will run up thin with insufficient branches. Give more air in the autumn; in the night, through the winter, a temperature of 50° will be enough, and just as much water as will keep the soil fairly moist should be given. In March use a little more warmth, and as soon as they show signs of beginning to grow, move them into 9-inch or 10-inch pots, treating them during summer as advised for the preceding season Should any of the branches evince a disposition to out-grow the rest, cut them back. The pots they are now in will be large enough for the season. Treat as before during the summer and following winter, and in the spring they should be planted out where they are to remain. The best position is against the end of a house, where their heads will get a fair amount of light, and a small border can be made wherein to turn them out; drain it sufficiently and fill it with turfy peat, to which add a moderate quantity of sand and some broken crocks. The shoots should be trained out in fan shape, and will only require to be kept regularly arranged to cover the allotted space. They will flower during the ensuing summer, after which slightly cut them in and encourage further growth. Each year when the blooming is over they will want more or less shortening back according to the extent to be covered. When the soil gets tolerably well filled with roots a good plan is to give weak manure-water once a week through the growing season. If this course is pursued, the result will be sturdy examples that will in due season produce plenty of flowers.

There are only a small number of species in cultivation, of which the undermentioned are the most desirable:—

R. amœna. A pretty rose-coloured kind that blooms in the summer and autumn. A native of Guatemala.

R. gratissima. Flowers pink, a fine species which, treated as above advised, grows well. It comes from Mexico and blooms in the summer and autumn.

R. versicolor. Has red flowers, and is also a summer and autumn bloomer; from Central America.

INSECTS.—These plants are not usually much subject to insects if they are kept syringed, as they should be, during the summer, and they are not placed in contact with other things that are affected with scale; this is troublesome when once it gets established on them, and it is best removed by sponging.

RONDELETIA SPECIOSA MAJOR.

This and the smaller-flowered type are stove plants, and possess much to commend them to the general cultivator. They are frequently seen on the exhibition table, but are scarcely showy enough to find favour with growers for show purposes; this, however, does not in any way detract from their merits as regards decoration or the production of cut flowers. For the comparatively small quantity of high-coloured flowers that a tasteful bouquet should contain, we know of no plant more suitable than the Rondeletia; it possesses the essential property of endurance when the growth and flowers have been made under the conditions requisite to impart this character to them. To this in the selection of flowers for such purposes, sufficient attention is not always given. The flowers are equally durable on the plant, and will keep fresh for many weeks in a conservatory or greenhouse—that is if the plant has been grown so as to avoid the soft, tender state, consequent upon too much heat and an over-moist atmosphere, with the absence of sufficient light, for the Rondeletia is more of an intermediate house subject than of an ordinary stove. It is a native of Havana, and will winter without injury in a night temperature of 50°, with a corresponding rise during the day. Hence those who have the means for keeping up as much heat as this need not hesitate to attempt its growth. It is a slow-growing plant, very much finer-rooted than the generality of stove subjects, and a very much slower grower. On this account, and coupled with the fact that it will bear cutting in freely every season, it can be kept to a medium size for a number of years.

Cuttings made from the young half-ripened shoots will strike freely in a temperature of 70° at any time of the year when they can be had in this state, but spring will best suit the generality of growers, for at this season it is usual to propagate a number of different plants, which can be accommodated to a similar routine of treatment. Insert four or six together in a 4-inch pot, drained and half filled with a mixture of sand and peat, the upper portion all sand. Keep moist and moderately close under a propagating glass. They will root in a month, and must be moved singly into small pots before the roots exist in such quantity as to become matted, using good fibrous peat, with enough sand to keep it open. Although the Rondeletia will thrive well in an intermediate temperature, yet, as it is a slow grower, no harm will be done by keeping it for the first twelve months subjected to more warmth—indeed that will be rather an advantage, as in this case it will attain a larger size in the time. Plenty of light is an essential, and therefore it will be well to place the young plants on a side stage immediately under the glass. Very little shade, and that only during the hottest part of the day, will be needed, for its somewhat hard-textured leaves are not susceptible of injury from the sun, except where absolute scorching takes place. A moderate admission of air in the middle of the day, proportionate to the state of the weather, will be required, and the house should be closed early enough to secure for some hours in the latter part of the afternoon the benefit of a close sun-heated atmosphere, which is very much to be preferred to the heat originating from the use of fire alone. A slight damping overhead with the syringe at this time should also be given. As soon as the young plants have fairly commenced to grow it will be necessary to stop the leading shoot. Attention to this matter is of more importance in the case of the plant under notice than in that of the majority of stove subjects, for if left to itself it is of a somewhat erect habit, and the wood is of so hard a nature that when it acquires age and strength it cannot be trained; the stopping must be repeated until a sufficiently bushy head is secured. By the middle of July the plants will require another shift into pots 2 or 3 inches larger, according to the quantity of roots they have got; let the soil be a little more lumpy, it should also be of the best fibrous description that will last long, for although the plant will bear its ball reducing with a view to partially renewing the soil when it has become exhausted or adhesive, still its roots are produced in such a mass that the soil cannot be shaken away without much disrooting. It thus becomes necessary to provide soil that will be of an enduring nature, so as to keep in a suitable condition for several years. Tie the shoots out in a horizontal position to lay the groundwork for the future specimen.

As autumn approaches, give more air, less moisture in the atmosphere, and discontinue the use of the syringe and shading, reducing the heat as winter comes on, during which time the night temperature may be kept at an intermediate warmth of 50° or 55°, with 5° or 10° higher in the day. Give more heat about the beginning of March, shortly after which they will require moving into other pots, which should be 3 inches or 4 inches larger; use soil of a similar description to that advised at the last removal, and again pinch out the points of all shoots that have got so long as to have a straggling appearance. As the summer advances treat as recommended during the preceding. It is naturally so free in flowering that it will bloom in a small state; if blooming subjects are required, a portion of the plants may be allowed to flower, and in that case no further stopping must be resorted to until after the blooming is over. Those intended to be grown on so as to get them up to a considerable size with as little delay as possible, must be stopped as they require it, and all will bear another shift about July. Be guided by the condition of the roots and the size of the plants individually in determining the size of the pots they are moved into. Continue to treat as in the previous autumn and during the following winter as before. From this time forward the treatment required will be of a routine character as regards spring potting, which will be all the shift the plants will need during the year. They may be expected to flower in June each season, and if, on the decay of the blooms, they are cut out and not much length of the shoots removed, they will again flower by the middle of September. When in bloom the plants will bear moving to a conservatory or other house where required for decorative purposes.

After the second flowering they must

have the whole of the shoots shortened so far back as to keep the specimens in a sufficiently compact form without too much formality; by this means they can be kept in a healthy blooming state for years, and when they get as large as required, they must not be potted oftener than every second year, but may be had in a vigorous condition by the use of manure-water. When they have arrived at this stage it is well to cut the plants back after they have completed their first bloom, and as soon as they have broken turn them out of the pots, reduce the ball one-third or so and return them to the same pots. By carrying out the operation at this season, there will be time enough for the roots to get possession of the new soil, and to make stout growth before winter, which will bloom satisfactorily the ensuing summer. So managed, the plants will last for many years. They will also bear heading down to within a few inches of the pot, but in this case the operation should be performed early in the spring, just as growth is about to commence, first letting the soil get moderately dry, at once placing the plants in a brisk heat, and giving no water, except by syringing overhead, until the cut-back stools have pushed shoots. When these have advanced 2 inches or 3 inches, the balls may be freely reduced and placed in smaller pots, after which the stopping of the shoots and subsequent treatment may be in accordance with the manner in which the young plants have been advised to be grown.

INSECTS.—Mealy bug and scale will live on the Rondeletia, but do not thrive as on foliage of a more succulent description. When affected, the best remedy is washing with strong applications of insecticide in the autumn when growth is complete. Thrips, if present in the house or pit in which it is grown, will also attack it. These can be best destroyed by fumigation or washing with tobacco-water.

ROSA.

Roses have always held the first place as outdoor flowers, and of late years their cultivation under glass has been much extended and greatly improved, especially in the treatment required to produce bloom during the winter and early spring months. The great difficulty to contend with in forcing Roses has always been the natural susceptibility of the foliage to mildew, much increased in the soft, delicate leaves produced in artificial warmth. But experience has shown that Roses can be so treated under glass as to reduce the attacks of the parasite within such limits that it can be easily dealt with. The free admission of air, so necessary in the case of other plants to prevent mildew, is found with Roses grown in heat to be the certain means of causing it: the least current of cold air coming in contact with the tender leaves in winter and early spring is all but sure to be followed by mildew. Whatever air is given during the time above-named should be at the ridge of the house alone, and this in small quantities. It will thus be seen that Roses to be grown as they should be in the early part of the year require a house to themselves.

Many of the hybrid perpetuals and the Noisettes answer well for indoor culture, but the Tea varieties are most to be depended on, especially for flowering in winter and spring. Roses for pot culture will do either on their own roots, or on the different stocks usually employed. Cuttings may be struck at different seasons in the spring, using the immature young shoots obtained from plants that have been grown in warmth. Put five or six together round the sides of small pots filled with sand, and keep moderately close, moist, and shaded in a temperature of about 60°; so treated, the greater part will strike, after which gradually inure them to the air of the house or pit in which they stand. Give them plenty of light, with shade when it is sunny, and admit whatever air is found necessary to prevent the temperature from rising too high, as far away from the plants as possible. When they have got plenty of roots move singly to 3 or 4 inch pots, using good strong loam, with some manure and a little sand added, pressed solid in the pots. Keep in a growing temperature, and stop the points when they have made some growth. A cold frame or pit will do for them during the summer, with a little shade when the weather is bright; give water as needed, and syringe freely in the afternoons. Towards autumn give more air, and winter them out of the reach of frost. The Tea varieties are scarcely ever at rest, except when kept so cold as to stop growth, and if they can be accommodated through the winter with a greenhouse temperature, or a few degrees higher, they will gain much in size; where such is available move them into pots a size or two larger in the autumn, shortening the shoots a little at the same time. In this way they will make pretty plants before spring, producing a nice sprinkling of flowers. All that is further required with the Tea varieties under notice is to continue to treat as in the preceding summer, shading from the sun, syringing regularly daily, and giving manure-water freely until July, when the plants may be stood out-of-doors, on a bed of ashes to keep out worms; care should be taken that they do not want for water. In August give larger pots to those that require it, seeing that the drainage of all the stock is right, and towards the end of September take them indoors. Some good growers of Tea Roses never turn their plants out, but keep them wholly under glass. By replacing the old soil with new, and careful attention to keep them free from aphides, red spider, and mildew, this section of Roses may be kept in good condition for many years in pots not more than 10 or 11 inches in diameter, the shoots being cut in moderately each year after flowering.

Grafting is usually done in winter, the stocks previously being raised from cuttings, which are transferred to little pots, headed down close to the bottom, the grafts put in and then confined in heat until the union has taken place, and some growth been made; afterwards they are kept on in a warm house until there is enough solar heat to keep them moving, shifting into larger pots as growth advances. Treat subsequently as advised for the plants raised from cuttings.

The Tea varieties when grown, as they always should be, in a light house and near the glass, will bear through the autumn and winter a night temperature of 50° or 55°; the favourite white sort Niphetos should have 5° more than this; the day temperature ought to be a little higher according to the dull or sunny character of the weather. All Roses under pot culture, or when planted out under glass, should have good rich holding loam to grow in—they do not like light soil—and in potting it should be rammed hard so as to make it solid; and one-sixth of rotten manure, with a small quantity of sand, should be added if the loam is very heavy. The Tea varieties, which are mainly to be depended on for bloom through the autumn and winter as well as much of the rest of the year, seldom fail to produce flowers from the growth they are continually making when it is not too weak, consequently it is necessary to supply them regularly with the requisite sustenance to keep up their strength. This can be done by the use of manure-water once a week or so when in active growth; some of the light artificial manures applied to the surface of the soil in the pots so as to admit of being washed down by the water given, answers admirably for Roses of all kinds, but especially for the Teas. The usual course taken with the hybrid perpetuals intended for pot culture, is to strike the cuttings or carry out the grafting operations out-of-doors, and when the plants have grown so as to acquire enough strength to take them up and pot them in autumn, after which they should be kept cool out of the reach of frost, and brought on slowly into flower in spring with little fire-heat the first season; they should be stood out-of-doors where they will be well cared for during the summer when they have bloomed; a portion of the soil should be removed in the autumn, and larger pots given to those that require them. After thus having a year's growth in the pots so as to enable them to get established they may have more heat.

The hybrid perpetual varieties should not be forced for bloom in the dead of winter, as the Tea sorts may easily be, as they do not bear forcing so early as the Teas. If forced so as to bloom later the plants will go on improving for years, in the same manner that the Teas will. When planted out in the house they occupy, and grown bush fashion, Roses attain a large size, and yield quantities of flowers, but are not so much under control as to the time of flowering as when kept in pots. It is unnecessary to speak of the way in which Roses may be used when planted out and grown as roof-climbers, or in covering back walls in greenhouses, further than to point to the fine appearance they have when well managed, and when suitable varieties are chosen, although with the assemblage present they cannot be expected to do so well as when they have a house to themselves. Where Roses are used as climbers in a house where other plants are grown, none but the best growers, with leaves that are the least subject to mildew, should be employed. Where planted out the soil should be well supplied with manure-water, or surface dressings such as advised for the pot plants.

The following varieties are suitable for pot culture:—

TEAS.

Catherine Mermet. Flesh colour.

Devoniensis. White.

Gloire de Dijon. Yellow, shaded with salmon.

Goubault. Rose, centre buff.

Homer. Rose, salmon centre.

Isabella Sprunt. Canary yellow.

Madame de St. Joseph. Salmon pink.

Madame Falcot. Apricot.

Madame Villermoz. White, centre salmon.

Niphetos. White.

President. Rose, shaded salmon.
Safrano. Apricot.

HYBRID PERPETUALS.

Alfred Colomb. Carmine red.
Annie Alexieff. Rose colour.
Baroness Rothschild. Light pink.
Beauty of Waltham. Rosy-crimson.
Captain Christy. Salmon-flesh.
Catherine Soupert. Rosy-peach.
Centifolia rosea. Bright rose.
Charles Lefebvre. Bright red.
Dr. Andry. Bright red.
Duchesse de Vallombrosa. Rosy-peach.
Duke of Connaught. Bright crimson.
Duke of Edinburgh. Crimson.
Edouard Andre. Red.
Emily Laxton. Bright rose.
Fisher Holmes. Bright scarlet.
General Jacqueminot. Red.
Henri Ledechaux. Carmine.
Jules Margottin. Red.
La France. Silvery-peach.
La Rosiere. Deep maroon-crimson.
Madame Lacharme. Pure white.
Madame Thérese Levet. Rose colour.
Mademoiselle Eugenie Verdier. Rosy-salmon.
Marie Baumann. Crimson-red.
Marquise de Castellane. Rose colour.
Pierre Notting. Deep red.
Souvenir de Victor Verdier. Bright red.
Star of Waltham. Carmine.
Victor Verdier. Rose colour.
White Baroness. Pure white.

The undermentioned are suitable for climbers :—

Belle Lyonnaise. Lemon colour.
Celine Forestier. Sulphur-yellow
Cheshunt Hybrid. Light carmine.
Climbing Devoniensis. White.
Desprez à fleur jaune. Sulphur, red, and buff.
Gloire de Bordeaux. Silvery-white and rose.
Gloire de Dijon. Yellow, shaded with salmon.
Jeanne d'Arc. White.
Lamarque. White.
Madame Marie Lavelley. Rose.
Madame Trifle. Lemon colour.
Marechal Niel. Golden yellow.
Ophirie. Copper and nankeen.
Reine Olga de Wurtemberg. Bright red.

MILDEW, which has already been noticed as the worst enemy of Roses grown under glass, must be continually sought for, and as soon as the least sign is seen of the young leaves puckering or curling, flowers of sulphur must be dusted on the affected plants. If the parasite is left unchecked for even a few days it spreads in all directions, causing the leaves to fall off with the inevitable weakening of the plants that follows.

INSECTS.—Red spider and aphides are the insects that affect Roses; to keep the former down it is necessary that the plants should be syringed freely every day during the active growing season, and twice a week at least in winter, doing the work thoroughly by getting the water to the under side of the leaves as well as the upper surface. If the syringing is well and regularly done aphides seldom give much trouble; but if they appear fumigate with tobacco moderately, repeating the application until the insects are destroyed. When Roses are used as roof-climbers in houses where other plants are grown, such as in conservatories, the syringing recommended must be regularly attended to; neglect of this is generally the cause of Roses doing indifferently when grown in this way.

RUSSELIA.

These are graceful-habited stove plants, and very distinct as regards general character. R. juncea is the best known and most usually cultivated species. It has slender, Rush-like branches, which droop in such a way as to give it at all times a handsome appearance, enhanced by its scarlet tube-shaped flowers. Russelias root freely from cuttings made of small pieces of the shoots. If, in spring, these are inserted, five or six together, in 4-inch pots filled with sand, and put in a warm house or pit, shaded and moist, under a bell-glass, they will root in a month, after which shift them singly into 3-inch pots in fibrous loam with a little sand added. Place them in a light position in a temperature that will do for ordinary stove plants, give air in the daytime and maintain a moderately, not too humid, atmosphere; little shade will be required, except in very bright weather.

Plants of these Russelias are inclined to branch naturally, but it will be advisable, as soon as the growth is fairly commenced, to pinch out the points of the shoots; this will promote a bushy condition. Syringe overhead daily through the summer; by the end of July shift them to 5 or 6 inch pots. Each plant should have a stick to support the centre shoot, the side branches being allowed to hang down naturally. Reduce the heat towards the end of September; a minimum temperature of 60° will be sufficient in winter. In spring, about March, give them 7 or 8 inch pots, and when fairly got into growth pinch the points out of the strongest shoots; keep them supplied with water at the roots, but they do not require to be so moist as some plants. Give increased warmth as the summer advances, and treat generally as in the preceding season; they may be expected to bloom about July or a little later, and will keep on flowering for some time. Nothing more will be needed except additional root-room each spring until they occupy pots 12 or 13 inches in diameter; after that each season some of the old soil may be shaken away and new substituted, giving a little manure-water during the height of their growth. They are good plants for hanging baskets.

R. juncea. Has very narrow leaves, bears bright scarlet, pendent, tubular flowers, and is a native of Mexico.

R. multiflora. Bears bright red flowers, which are produced freely when the growth is well matured through being exposed to sufficient light and air. It comes from South America.

INSECTS.—Russelias are not much subject to the attacks of insects, but mealy bug and scale will live upon them; if affected by the former, lay the plants down on their sides and syringe them freely with tepid water. Scale must be removed by sponging.

SABAL.

A genus of stout, large-growing stove Palms, with fan-shaped leaves, only suitable for a large house where their big leaves have room to extend.

For propagation and cultivation, see Palms, general details of culture.

S. Blackburniana (syn.: S. umbraculifera). A large, strong-growing species that forms a thick trunk, on which are borne very large fan-shaped leaves, deeply plaited. It comes from the West Indies.

SACCHARUM.

This is a genus of reed-like stove plants to which much interest is attached from the fact that one species S. officinarum, which produces the sugar of commerce, belongs to it. All the species are easily grown, and have more or less elegance in their appearance.

Propagation may be effected by division of the crowns, which should be carried out in spring before growth commences and the plants at once placed in a brisk growing heat; they thrive in a mixture of loam and peat, with some sand added. After they get established a cool stove or intermediate heat is all that will be required, with abundance of water whilst growing, and a free use of the syringe, keeping the soil drier in winter.

S. officinarum. This species forms straight stems clothed with handsome green leaves. It grows to a height of 8 or 10 feet, and is very effective for use in the many ways that fine-leaved plants are now employed. It comes from India.

S. violaceum. Differs little in appearance from S. officinarum, except that the stems have a purple or violet colour, which, contrasting with the green shade of the leaves, enhances their appearance. From the West Indies.

INSECTS.—Red spider and aphides are sometimes troublesome on these plants, but a free use of the syringe will usually be sufficient to keep the former in check; for aphides fumigate.

SADLERIA CYATHEOIDES.

A beautiful, distinct-looking Tree Fern of moderate growth. At present it is very rare in collections, but deserves a place in even the most select company. It comes from the Sandwich Islands, and requires warm treatment.

For propagation and cultivation, see Ferns, general details of culture.

SALVIA.

Amongst the best autumn and winter flowering plants are the Salvias. Being remarkably easy to grow, and abundant bloomers, they at once become most valuable for greenhouse decoration, and for furnishing flowers for cutting. Cuttings of the various kinds struck in the spring have ample time to get large enough for flowering in autumn and winter; if put in about the middle of April, five or six together in 6-inch pots in sand, stood in a temperature of 60°, kept close, moist, and shaded, they will strike in ten days or a fortnight; then give more air, and as soon as they have had time to make a fair amount of roots move singly to 3-inch pots, and for a week or two stand in a similar temperature to that in which they have been struck. When they get established pinch out the points of the shoots, and give air freely; by the end of May the plants will be better out in a cold pit where they can have plenty of light. Again pinch out the points of the shoots when they have grown a joint or two; they are quick growers, and in June should be moved to larger pots, the size being varied in accordance with that of the sorts grown, the smaller growers, like S. Pitcherii and others of the autumn bloomers, may be put at once into their flowering-pots 8 or 10 inches in diameter, while the very strong growers, such as S. gesneræflora, will do put in pots of this size to be moved on later to others 3 or 4 inches larger. After this time they will be better out in the open air, and the shoots should be again stopped as soon as they have begun to grow freely. See that in all their stages these plants are well supplied with water, as if let to get dry the lower leaves suffer and their appearance is spoilt, while, in addition, the growth receives a check. Put sticks for support as required, and stand far enough apart to prevent their being drawn. When the pots get full of roots give manure-water freely. Let them stand out-of-doors as long as there is no danger of frost—when there is they must be moved under glass. The early-flowering kinds will give a fine display through October and November.

In place of keeping Salvias in pots all through the summer some growers turn them out in the open ground about June, lifting and putting them in pots towards September, which saves some trouble in watering, and if the roots are cut round with a spade a fortnight before taking them up the plants do not suffer much check; give them plenty of water, and keep the house or pit in which they are stood a little close for a week or two. After flowering all but enough plants to furnish cuttings may be thrown away.

The following are desirable kinds:—

S. Bethellii. Rose colour.
S. albo-cœrulea.
S. coccinea grandiflora. Salmon red.
S. elegans. Scarlet.
S. gesneræflora. Bright scarlet. A fine late sort.
S. Heerii. Orange and red.
S. ianthina. Purple.
S. patens. Blue.
S. patens alba. White.
S. Pitcherii. Blue.
S. splendens Bruantii. Scarlet.
S. tricolor. Purple, white, and scarlet.

INSECTS.—Salvias are not much troubled with insects except aphides, for which fumigate or syringe with tobacco-water. If red spider affects them syringe freely with clean water.

SANCHESIA.

Evergreen stove plants, combining somewhat handsome flowers with beautiful variegated foliage, which latter is their greatest attraction. The plants have a pretty effect in a small state confined to a single shoot, or larger when grown in the form of a dense bush. In general appearance they are not unlike Aphelandra Leopoldii. They are of easy culture, nice examples in 6 or 8 inch pots can be had in a few months from spring-struck cuttings.

Their method of propagation and after treatment is similar to that advised for Aphelandras, which see.

S. glaucophylla. Ground colour of leaves green, mid-rib red, lateral nerves yellow. A native of Eucador.

S. nobilis variegata. Has large, handsome leaves, ground colour lively green, the nerves yellow, well defined. Also from Eucador.

SANDERSONIA AURANTIACA.

A tuberous-rooted plant that may be grown as a climber; in habit and general appearance somewhat resembling the Gloriosas. It is the only species of the genus at present in cultivation. The flowers are orange-yellow in colour. It will succeed under treatment such as advised for Gloriosas, which see. It comes from Natal.

SANSEVIERA ZEYLANICA.

A singular evergreen stove plant with long, narrow, stout, erect sword-like leaves, deep green in colour, banded with white, springing from creeping stems. Those who are fond of plants with a decidedly distinct habit can scarcely fail to like this Sanseviera. It is one of a moderately numerous genus, more of which, for ordinary purposes, it will not be necessary to grow.

Its cultivation is by no means difficult. It is increased by suckers which should be taken off in spring before growth begins; all that is necessary is to divide the crowns into pieces, large or small, according to the inclination of the cultivator—a large plant will bear separating into single crowns, or simply cutting in half; the pieces should have as much root attached to each as can be got, and should be placed singly in pots large enough to hold them. The plant will grow in either peat or loam with a moderate quantity of sand added. When potted grow on in a brisk stove heat, giving them a moderately light position, with a little shade and a confined atmosphere until they begin to grow, after which give air daily with no shade unless the leaves are found to burn. This Sanseviera does best with a liberal amount of heat in the summer, and in winter should have a night temperature of 60°. It comes from Ceylon.

INSECTS.—The leathery texture of the leaves prevents their becoming a prey to many insects, but scale sometimes attaches itself to them and the creeping stems; when it appears it can best be removed by sponging.

SARMIENTA REPENS.

A creeping evergreen stove Gesnerad. Like most allied species it is easy to manage, and may be grown in a pot with the shoots supported by sticks, or in a pot or basket suspended from the roof, with the shoots allowed to hang down; or, if in a basket, trained round it so as to cover the surface. In this way they have a pretty effect when not kept too close, letting the points of the shoots have liberty. Thus treated, its red flowers are seen to advantage. It requires the same treatment as Columneas, which see. It comes from Chili.

SARRACENIA.

Among the singular forms now and then assumed by plants, few can match the Sarracenias, or Side-saddle Plants, as regards grotesque shape and beautiful leaf colouring, and this wholly independent of their equally curious and beautiful flowers, which, like the plants, are entirely different from those of all others. All the species have hollow leaves more or less extended, and succeed best in an intermediate temperature; some, like S. purpurea, are stout, short, and much distended, others, like the different forms of S. Drummondii, funnel or horn shaped, and as much as 3 or 4 feet in length when well grown; in all the leaf-blade is more or less extended, so as to form a lid to the mouth of the pitcher—not very decided in S. purpurea, but large and completely overlapping the orifice in some of the varieties of S. flava. The whole of the family belong to what have recently been called Insectivorous plants. The Sarracenias are easily grown, if their wants are fairly well supplied. Where failure occurs it is mostly traceable to their being kept too warm. An intermediate temperature both summer and winter suits them best, although some of the kinds, such as S. purpurea, will grow in a cold frame or even live out-of-doors in certain places, but its appearance is not nearly so good as when grown in a little heat. A night temperature of 48° or 50° in winter, and 60° in summer at night, and from 70° to 75° in the daytime will be found to suit them.

Soil is another most important matter. The fibrous material with all the earthy matter shaken out of the best Orchid peat, added to an equal part of chopped sphagnum and a good sprinkling of potsherds or charcoal, with a little sand, should be used. The crowns should be divided about the beginning of February before the roots have begun to move; they may be potted singly, or grown several together in pots proportionate in size to the numbers occupying each. A 4 or 6 inch pot is big enough for a single crown. The pots should be one-third filled with drainage, and the material pressed moderately firm about the roots, giving them immediately as much water as will soak the whole. The plants should then be stood on some moisture-holding medium; the nearer the glass they are the stouter they will grow, and the higher coloured the pitchers will come. They are swamp plants, and should be watered twice a week in winter, and every day through the growing season—at all times the soil should be kept quite wet. If shade is given in summer it should be with very thin material, and none is required unless the sun is found to burn the leaves. They are better not syringed overhead, as water applied in this way to the tall-growing kinds makes the pitchers weak and scarcely able to support themselves. They look the best when a number of crowns are grown together, say as many as will occupy a 14 or 15 inch pot. It is important that they should have the whole of the material shaken away once a year and replaced with new, or it will get sour and cause rotting of the roots, a condition from which the plants take years to recover. All the kinds, except the different forms of S. Drummondii, should be repotted about the time mentioned for propagation by division of the crowns, that is, before growth commences. The varieties of S. Drummondii ought to be potted in July, as the principal season of producing their pitcher-like leaves is in autumn. The spring growth of these varieties is mostly confined to leaves that do not develop to pitchers, although when very strong they will produce a number of pitchers along with the other leaves in spring. If the shaking out and potting is done after any root-growth has begun, the pitchers that follow are liable to be deformed. Propagation by pieces of the root-stems should be carried out at the time of the winter potting. If the plants are wanted to gain strength fast, the flower-stems should be pinched out as soon as they appear.

All the undermentioned kinds are well worth growing:—

S. atrosanguinea. A very handsome species, thickly streaked with red on the upper part of the pitcher, which colouring assumes the form of a solid blotch on the greater portion of the inside of the lid. Flowers white.

S. Chelsonii. A hybrid variety of great beauty. It is a cross between S. purpurea and S. rubra. The pitchers, intermediate in habit between the two parents, attain a height of 18 inches. In shape they partake of the character of S. purpurea, and are highly coloured with crimson-purple.

S. crispata. Another fine kind, handsomely pencilled longitudinally with red. Flowers white.

S. Drummondii alba. The tallest of all. We have had this sort with pitchers 4 feet high. The upper part of the pitchers is white, distinctly mottled and veined with green. Flowers crimson-purple.

S. Drummondii rubra. A beautiful, highly-coloured sort, with stout, tall, erect pitchers, the upper portions white, suffused and netted with red. Flowers crimson-purple.

S. flava maxima. This makes the largest pitchers of all the family. The lids of a strong example will attain a width of 6 inches, the upper portion of the pitchers is of an olive-yellow shade, the lid streaked with crimson. Flowers yellow.

S. flava ornata. A large, stout-growing, very handsome sort, the upper portion of the pitchers and their lids covered with a close network of reddish-brown. Flowers yellow.

S. psittacina. A small but beautiful kind with prostrate pitchers deeply coloured with red towards the extremities; the lid forms a complete hood. Flowers purple.

S. purpurea. A very stout, short-pitchered kind, the pitchers are procumbent and deeply suffused with, or almost wholly, reddish-purple towards the extremities. Flowers purple.

S. rubra has medium-sized pitchers, deeply veined and shaded on the upper part with red, as also the lid. The flowers of this species are ruby-coloured, and deliciously scented like Violets.

S. variolaris. A medium grower, with erect pitchers, spotted on the upper part with white; the lid is hooded. A distinct kind. Flowers yellow.

All the species are natives of North America.

INSECTS.—Sarracenias are not generally much affected with insects beyond thrips and aphides, which are often troublesome, and immediately these are found they must be at once destroyed, or they will spoil the pitchers. Fumigation and sponging with clean water are the safest means to employ with these plants.

SCHUBERTIA.

There are two species of these pretty, free-blooming stove plants, both natives of Brazil—S. grandiflora, which bears white blossoms, and S. graveolens, which has pale yellow flowers. Both are very distinct in general appearance and also in the character of their flowers, which are produced during the summer months. They can be struck from cuttings composed of the young shoots, such as have sprung from branches that have been cut back and have attained a length of 4 inches or 5 inches, taking them off with a heel in spring, and putting them singly in little pots in sand. They should be set in a close, shady place under a propagating glass in a temperature of 70°; they will usually root in about a month or six weeks. After allowing a little time for them to get inured to the air of the house move them into 4-inch pots, using good turfy peat containing plenty of vegetable fibre, and adding sand enough to keep it porous.

As soon as they begin to grow pinch out the points of the shoots, otherwise, from their natural scandent habit, they will run up thin and insufficiently furnished. They will thrive during the summer under similar conditions of heat, shade, moisture, and air as are found to answer for the generality of evergreen stove plants; give them pots 3 inches or 4 inches larger about the beginning of July, and insert a few sticks in the soil to train the shoots to. They may produce a few flowers towards autumn, but it is better not to consider these the first season, and to get the plants as strong as possible for the second year. Give them all the light that can be afforded through the autumn, with more air and a drier atmosphere, wintering in a temperature of 60°. In the spring, when the heat of the house is raised, move them into 10-inch or 12-inch pots, and treat them as in the previous summer; keep the shoots trained so that they may not get entangled. Manure-water will assist the plants when their time of blooming approaches, which if all goes well will be about July. They will keep on flowering until the end of August; afterwards they should have their shoots well shortened back. Winter as before, give larger pots in spring, and in other respects treat as in the preceding summer; after this the plants may be either cut back and grown on again, or discarded and their place taken by young ones.

Insects.—The leathery texture of the leaves prevents their becoming a prey to many insects, but scale sometimes attaches itself to them and the creeping stems; when it appears it can best be removed by sponging.

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A creeping evergreen stove Gesnerad. Like most allied species it is easy to manage, and may be grown in a pot with the shoots supported by sticks, or in a pot or basket suspended from the roof, with the shoots allowed to hang down; or, if in a basket, trained round it so as to cover the surface. In this way they have a pretty effect when not kept too close, letting the points of the shoots have liberty. Thus treated, its red flowers are seen to advantage. It requires the same treatment as Columneas, which see. It comes from Chili.

SARRACENIA.

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All the undermentioned kinds are well worth growing:—

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S. crispata. Another fine kind, handsomely pencilled longitudinally with red. Flowers white.

S. Drummondii alba. The tallest of all. We have had this sort with pitchers 4 feet high. The upper part of the pitchers is white, distinctly mottled and veined with green. Flowers crimson-purple.

S. Drummondii rubra. A beautiful, highly-coloured sort, with stout, tall, erect pitchers, the upper portions white, suffused and netted with red. Flowers crimson-purple.

S. flava maxima. This makes the largest pitchers of all the family. The lids of a strong example will attain a width of 6 inches, the upper portion of the pitchers is of an olive-yellow shade, the lid streaked with crimson. Flowers yellow.

S. flava ornata. A large, stout-growing, very handsome sort, the upper portion of the pitchers and their lids covered with a close network of reddish-brown. Flowers yellow.

S. psittacina. A small but beautiful kind with prostrate pitchers deeply coloured with red towards the extremities; the lid forms a complete hood. Flowers purple.

S. purpurea. A very stout, short-pitchered kind, the pitchers are procumbent and deeply suffused with, or almost wholly, reddish-purple towards the extremities. Flowers purple.

S. rubra has medium-sized pitchers, deeply veined and shaded on the upper part with red, as also the lid. The flowers of this species are ruby-coloured, and deliciously scented like Violets.

S. variolaris. A medium grower, with erect pitchers, spotted on the upper part with white; the lid is hooded. A distinct kind. Flowers yellow.

All the species are natives of North America.

INSECTS.—Sarracenias are not generally much affected with insects beyond thrips and aphides, which are often troublesome, and immediately these are found they must be at once destroyed, or they will spoil the pitchers. Fumigation and sponging with clean water are the safest means to employ with these plants.

SCHUBERTIA.

There are two species of these pretty, free-blooming stove plants, both natives of Brazil—S. grandiflora, which bears white blossoms, and S. graveolens, which has pale yellow flowers. Both are very distinct in general appearance and also in the character of their flowers, which are produced during the summer months. They can be struck from cuttings composed of the young shoots, such as have sprung from branches that have been cut back and have attained a length of 4 inches or 5 inches, taking them off with a heel in spring, and putting them singly in little pots in sand. They should be set in a close, shady place under a propagating glass in a temperature of 70°; they will usually root in about a month or six weeks. After allowing a little time for them to get inured to the air of the house move them into 4-inch pots, using good turfy peat containing plenty of vegetable fibre, and adding sand enough to keep it porous.

As soon as they begin to grow pinch out the points of the shoots, otherwise, from their natural scandent habit, they will run up thin and insufficiently furnished. They will thrive during the summer under similar conditions of heat, shade, moisture, and air as are found to answer for the generality of evergreen stove plants; give them pots 3 inches or 4 inches larger about the beginning of July, and insert a few sticks in the soil to train the shoots to. They may produce a few flowers towards autumn, but it is better not to consider these the first season, and to get the plants as strong as possible for the second year. Give them all the light that can be afforded through the autumn, with more air and a drier atmosphere, wintering in a temperature of 60°. In the spring, when the heat of the house is raised, move them into 10-inch or 12-inch pots, and treat them as in the previous summer; keep the shoots trained so that they may not get entangled. Manure-water will assist the plants when their time of blooming approaches, which if all goes well will be about July. They will keep on flowering until the end of August; afterwards they should have their shoots well shortened back. Winter as before, give larger pots in spring, and in other respects treat as in the preceding summer; after this the plants may be either cut back and grown on again, or discarded and their place taken by young ones.

INSECTS.—If not attended to well in the matter of syringing daily during the growing season, they are liable to get infested with red spider and thrips, otherwise these insects do not usually trouble Schubertias. If mealy bug affect them, the plants should be laid on their sides and syringed freely with insecticide ; repeat the application until they are quite clean.

SCUTELLARIA MOCCINIANA.

This evergreen stove shrub grows to a height of about 2 feet; it has handsome foliage and bears from the points of the shoots close, compact bunches of tube-shaped, bright red and yellow flowers. It is a remarkably free bloomer, keeping on flowering almost the whole year round when any growth is being made, and on that account one of the best plants that has been introduced for years, as the flowers are equally effective on the plant or in a cut state, in which they last a considerable time. It succeeds in ordinary loam made moderately rich with rotten manure and mixed with sand. It may be propagated at any time of the year when bits of half-ripened wood can be had, such as the young growths which spring from the joint below where a stout shoot has been cut back; if these are taken off early in spring and put five or six together in pots just large enough to hold them, filled in the ordinary way, kept moist and covered with a propagating glass, they will root in a few weeks; after that shift them singly into 3-inch pots, using fresh loam fairly enriched, to which is added a full complement of sand. The latter is needed for all free-growing subjects of the nature of this plant, as they require a plentiful supply of water, and it is necessary that it should pass freely away, or the roots, though not delicate, are sure to get out of order.

As soon as the cuttings are fairly rooted pinch out the tops, and repeat this when the plants have made a couple more joints. An ordinary moderate hothouse temperature will answer through the year. With all plants of a continuous blooming habit it is advisable never to over-excite them by too much heat, or, on the opposite, to keep them so cool as to wholly stop growth. Directly the pots are fairly full of roots shift into others proportionate to the size to which the plants are expected to grow; they will flower at almost any size from that obtainable in 6-inch pots upwards. Water liberally as the roots get plentiful, give air freely in the daytime during summer, shade when the weather requires it, and syringe in the evenings during the season of active growth.

When the flowers are wanted in a cut state, it is well to use those produced by the strongest shoots, at the same time cutting these shoots moderately well back, so as to encourage the weaker branches and keep the plants in a symmetrical form. In spring, about the time the usual rise in temperature takes place, it is well to cut the plants freely back, so as to keep them from getting too tall, after which they may be turned out of the pots, a portion of the soil removed, and larger pots given, using loam of a moderately free character. If they are thus treated annually, with the additional help of manure-water through the summer, they may be kept in a thriving state for several years; but it is advisable always to have some young stock on hand, as moderate-sized examples for ordinary purposes will usually be found the best.

INSECTS. — The frequent use of the syringe during the most active period of growth generally keeps the plants free from insects, but if aphides or thrips affect them fumigate or dip in tobacco-water.

SELAGINELLA (LYCOPODIUM).

Although not so much varied in their appearance as their near allies, the Ferns, these beautiful plants are general favourites : their singular forms, with the different shades of colour they possess, from the deep green of S. plumosa to the metallic hue of S. cæsia, are very attractive. The sorts that find favour with cultivators are indigenous to widely different parts of the world—China, Europe, India, the Cape of Good Hope, and South America, all contribute to the assemblage of fine species now in cultivation. Some of the kinds will thrive in a greenhouse, others require a moderate stove heat, and all like a fairly moist atmosphere, with shade from the sun, and to be kept out of the reach of draughts, and in the case of nearly all never to be allowed to get dry at the roots.

They will grow in almost any kind of soil provided it is porous; in peat they usually don a deeper shade of green. They are easily propagated by division of the creeping stems, which most of the species possess, and produce roots from freely; the best time to propagate them is about the end of February, before the season's growth commences. The pieces separated from the old plants should always have a good portion of roots attached, in which case all that is necessary is to put them in well-drained pots or pans large

Selaginella Grandis.

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enough to allow of the extension they will make during the season, as it is not necessary to move them again before the spring comes round, when larger pots may be given proportionate in size to that which the plants are required to grow to. Give plenty of water through the growing season, and shade carefully from the sun; keep the atmosphere moist, admit a moderate amount of air daily, and moisten them overhead with the syringe in the evenings through the growing season. The soil in which they are grown is all the better for having a good sprinkling of potsherds, charcoal, or coal cinders mixed with it; any of these will answer in keeping the soil from getting sour, with the large amount of water required when the plants are in active growth. All the difference needed in the treatment of the warm and the cooler section is that the former should have a night temperature in the winter of from 54° to 58°, whereas the cooler species will not want more than 45°, with in the case of both a proportionate rise in the day; in summer a night temperature of 60° to 65°, with more by day according to the state of the weather, will answer for the warm division, and that of a warm greenhouse for the cool sorts, but even these usually look fresher for a little extra warmth.

The undermentioned are all distinct and handsome species, that require the most warmth :—

S. africana.
S. argentea.
S. concinna.
S. cuspidata.
S. Galeotii.
S. lævigata.
S. Lobbii.
S. Lyallii.
S. rubricaulis.
S. umbrosa.
S. uncinata.
S. Victoriæ.
S. Wallichii.

The following are greenhouse species :—

S. apus.
S. californica.
S. denticulata.
S. helvetica.
S. involvens.
S. Kraussiana.
S. Martensii variegata.
S. Poulterii.
S. serpens.
S. stolonifera.
S. variabilis.
S. Wildenovii.

SERICOGRAPHIS GHIESBREGHTIANA.

This handsome stove Acanthad is another of the select number of plants whose time of flowering occurs during the autumn or winter months, and on this account it is especially valuable. Its bright red tube-shaped flowers are produced freely from the points of the shoots of the current season's growth. It has a somewhat erect habit, but by attention to stopping in the younger stages of growth it assumes a bushy form. It is one of those quick-growing plants that are usually propagated annually in the spring for flowering in the ensuing winter, a mode of treatment by many considered preferable to that of growing the old plants on a second season, although by the latter course they can be had in a larger state. It forms a handsome object in the stove during the dull season, and the flowers when cut will stand fairly well if the previous treatment of the plants has been such as to enable them to attain all the strength of which they are capable.

Cuttings made from the young shoots which the plants, after blooming, will produce in ordinary stove heat, taken off in March and treated in the usual way in a moderately moist, confined atmosphere, will soon strike root; then put them singly into 4-inch pots, pinch out the points as soon as they begin to grow, and repeat this when a second growth has been made. As in the case of other quick-growing plants it is necessary to give it plenty of light, otherwise a weak condition is sure to follow. A single shift from the pots they are now in to those in which the plants are to bloom will be enough; this should be given them about the end of May; 8 or 9 inch pots will suffice, as when the soil gets full of roots they can be kept going by the use of manure-water. A low pit where they can be near the glass will be the best place onwards after the second potting, giving air freely in the middle of the day, during which time the plants will bear a day temperature of from 70° to 80°, with from 60° to 65° at night. Syringe daily to promote growth and keep down insects, using a thin shade when the sun is very bright; the shoots should be again stopped as soon as the roots have got established in the soil. The treatment required through the summer will be of a routine character until September; then give more air and expose the plants to all the light possible with a view to solidifying the growth and checking a disposition to over-lengthening of the shoots. As the days get shorter reduce the temperature in the day, but do not keep them too cool, especially at night, as, in common with all stove subjects that flower in the autumn or winter, if deficient of warmth the blooms will be thin and indifferent. Keep the heads of the plants close to the glass from the time the flowers are formed, and if the pots are very full of roots use weak manure-water once a week. After blooming, unless large specimens are wanted, it will not be necessary to retain more of the old plants than are sufficient to furnish stock for cuttings; keep them with the soil only a little moist through the time that intervenes from the flowering until they are again started into growth, during which period a temperature of from 55° to 60° at night will maintain them in health.

INSECTS.—This plant is not much subject to insects, but aphides, red spider, and thrips will sometimes attack it; for these fumigate with tobacco or dip in tobacco-water.

SMILAX.

Evergreen stove climbers suitable for covering walls or pillars or draping the roofs of large stoves. They are not much in favour, as in most cases plants of a more attractive character can be employed. Where grown, unless they have plenty of room for the shoots to extend, they should not have over much root space, although they do better planted out than when confined in pots.

They are easily increased by suckers which they produce freely; these should be taken off in spring, before the plants begin to grow, and put singly in 5 or 6 inch pots. They will thrive in either peat or loam, and an intermediate heat is sufficient for them. After the young plants have been grown for a year in pots they may be planted out.

The following are suitable for using in the way described:—

S. longifolia variegata. A distinct-looking plant; in colour the leaves are a combination of deep and greyish green. From Para.

S. Shuttleworthii. A new species; the ground colour of the leaves is green, with greyish-white markings.

INSECTS.—If well attended to with the syringe through the growing season little trouble need be anticipated from insects.

SOLANUM.

(Berry-bearing.)

Among the large number of Solanums existent there are two especially worth growing for the pretty appearance of their fruit, S. capsicastrum and S. pseudo-capsicum, the red berries of which render the plants so effective in the autumn and winter months. They are evergreen greenhouse plants that flower and produce their berries profusely in a small state.

They are often raised from seeds which germinate freely if stood in a temperature of 60° or 65°. Afterwards pot singly, and grow on during spring in an intermediate temperature. Through the summer put them in cold pits or frames, or plant them out in the open ground, taking up and potting in September. But as there is considerable difference in plants raised from seed in the quantity of berries they bear it is best to select the freest fruiters, and propagate from them by shoot cuttings. To have the berries ripe and fully coloured in autumn the cuttings should be struck by the end of the year; the soft points of the shoots root in a few weeks in a temperature of 65°, kept moist and close, after which move them singly to small pots; good loam with a little leaf-mould and sand suits them in every way. Keep in a temperature similar to that in which the cuttings were struck, and pinch out the points of the shoots as soon as they begin to grow, standing them near the glass with a little air in the day. Continue to treat in this way until March, when they will be ready for moving to 6-inch pots, in which they are to remain; previous to potting again stop the points of the shoots so as to secure bushy growth, which is essential to the appearance the plants should have when in fruit. Keep up a growing temperature by the aid of fire heat until the middle of April, after which no further assistance in this way will be needed. Cool greenhouse treatment is all these Solanums require, and the heat so far advised is only used with a view to get the young plants on in size sufficiently to cause them to bloom early enough so that their berries may have time to grow and ripen by autumn. Plants that are not wanted to have their berries ripe before the end of the year may be struck a little later. By the middle of May a cold pit will answer for them; air should be given freely in the daytime, with a little shade when sunny, and plenty of water to the soil; syringe freely every afternoon—this must be done regularly and thoroughly to keep clear of red spider, to which the plants are subject, and which, if present, quickly spoils the foliage. Continue this treatment through the summer, standing them close to the glass. By September the berries will be fast putting on their bright red tint, and after this time no more syringing will be required. Through the autumn and winter give ordinary greenhouse treatment in the matter of warmth, air, and water. Plants that had their berries ripe early, and have got shabby, may be cut well back early in the year, and when they have broken shaken partially out, put in pots a size larger and grown on as in the previous summer. So managed they can be used a second season, or they may be planted out half a yard apart in the open ground, where, if well attended to with water to the soil and syringing overhead, they will make handsome little specimens by the beginning of September, when they should be taken up and potted as already indicated.

INSECTS.—Red spider, to which these Solanums are subject, will be kept down if attention as advised in the matter of syringing is given. Aphides, which are also partial to them, must be destroyed by fumigation.

SOLANUM JASMINOIDES.

A deciduous climber with pretty flowers, suitable for growing on a rafter in a greenhouse.

It can be struck from cuttings in the spring, and grown on similarly to Sollyas, which see. It flowers over a considerable portion of the summer, and comes from South America.

SOLANUM OVIGERUM.

Among the annual species of Solanum is the singular egg plant; there are several forms, differing little in general character except in the colour of their fruit, of which there are white, red, violet, and yellow varieties.

The cultivation of all is the same; the seeds should be sown in spring, in pots or pans filled with fine loamy soil, to which some sand has been added; cover them lightly, and stand on a moderate hot-bed covered with an ordinary frame. Here they will do better than in a house. When the plants are up put them singly in small pots filled with soil well enriched with rotten dung, giving larger pots as required further on. During the early stages of their growth, and until the fruit has attained its full size, they should be kept in genial heat and be well supplied with water; give air daily, with a little shade when the sun is powerful, and syringe freely overhead to keep down red spider, to which they are subject. When the fruit has reached its full size and colour they may be stood anywhere in a cool house. From Africa.

INSECTS.—Aphides are partial to these plants, and must be destroyed by fumigation or they soon spoil the leaves.

SOLLYA.

These are very distinct evergreen greenhouse twining plants of slender habit; their pretty flowers bright blue—a colour so scarce among hardwooded plants—are produced in great profusion during the summer and autumn months; the flowers are small individually, but as they are borne in quantities the deficiency in size is fully compensated for. Plants in a healthy condition give a succession for a considerable time. They are more at home when used for training round a pillar in a conservatory, or for growing as single pot specimens on a trellis or other support, than when employed for draping the roof, a purpose that can be better effected by plants of larger growth. In fact, when grown with a view to training the branches to cover any portion of the woodwork in the conservatory it will generally be found better to confine their roots to a pot, unless the size of the border into which they are to be turned out is very limited, as, though anything but delicate rooters, like many of the plants that hail from the same region, their roots, in keeping with their heads, are of such moderate extent that their requirements can be better met by pot culture. Sollyas strike from cuttings, which should be obtained in spring from shoots that have some time before been cut back; take them off with a heel when about 3 inches long, keep close and moderately warm and they will strike in a few weeks, when move them singly into little pots, stopping the points as soon as they begin to grow. By the end of June give 4-inch pots, using a mixture of peat and sand; from the time they are established give them warm greenhouse treatment. A temperature such as required by ordinary greenhouse stock will answer through the winter. About the end of March or beginning of April give them a shift into pots 3 inches larger, make the soil quite firm, and insert half a dozen tolerably tall sticks just inside the rims of the pots, as whatever may be the ultimate intention as to the position the plants are to occupy it is better to support them in this way at first. After potting keep, as usual with plants of similar description, the atmosphere a little closer for two or three weeks, until growth has fairly commenced, and as soon as the weather gets sufficiently warm syringe overhead in the afternoons, shutting up early enough to close in a good amount of sun-heat. The plants require little stopping, but should any of the shoots take a decided lead it will be necessary to shorten them back to encourage the weaker ones; they will want attention from time to time in training the shoots regularly round the outsides of the sticks, otherwise, from the natural twining habit of the plants, they will lay hold of each other in such a way that it will be difficult to separate them without injury. Little shade is necessary, as from the leathery nature of their leaves they are able to bear exposure to the sun. From the naturally moderate growth of the plants it is not absolutely necessary to give them another shift through the summer, except in the case of any that may happen to be unusually vigorous—these may have pots a couple of inches larger about the end of June, and the roots will thus have sufficient time to get full possession of the soil before autumn. Cease using the syringe by the middle of August, and give plenty of air both day and night. Winter them in a temperature suitable for ordinary greenhouse stock, anything from 35° to 45° will suit them, as they are neither subject to mildew from a low temperature nor liable to be started into growth with a few degrees more heat. Keep the soil in a medium condition as to moisture through the winter, the roots are not so sensitive in this respect as many, and this renders them, like Rhynchospermum jasminoides, and a few others of similar character, very suitable for beginners in the cultivation of hardwooded greenhouse plants. Again, about the same time as the preceding spring, give another shift, if satisfactory progress has been made they will again stand about 3 inches more root-room; use the soil with as much fibre in it as possible so as to enable it to last long. It will now be necessary to determine in what way the plants are to be grown; if for a pillar, or over the front lights of a greenhouse, some wires should be placed to train them to. With these, as with all plants of like habit, it is better to tie the shoots than to allow them to cling to the supports by twining, as when the latter takes place removal, should it be necessary, either for the purpose of changing their position or of cleansing from insects, is invariably effected at a sacrifice of some of the branches. If the plants are required for pot specimens a moderate-sized wire trellis will be the best to grow them on; in this case also prevent them from becoming twined round the wires, and be mindful to clothe the bottom of the trellis first before allowing the shoots to ascend upwards or the lower portion can never be covered satisfactorily. Little more will be required except routine treatment, such as already advised, in giving more root-room when needed. As in the case of most plants of a similar character weak liquid manure during the growing season will be found beneficial.

S. Drummondii. From Australia.

S. heterophylla. A native of New Holland.

S. linearis. From Swan River.

INSECTS.—The tough leathery leaves afford little sustenance to such as red spider, thrips, or greenfly; where the syringe is used as advised during the summer months these are seldom troublesome, but should aphides attack the young shoots dip in tobacco or quassia water, or fumigate. Scale must be diligently sought for and removed by sponging, or the heads of the plants may be wholly dipped when at rest in a strong solution of insecticide.

SONERILA MARGARITACEA.

This is a particularly handsome small-growing stove plant, the bright pink flowers with prominent yellow anthers contrasting admirably with the lovely spotted leaves. It is a spreading, low-growing, semi-herbaceous Melastomad, which attains a height of 8 inches or 9 inches. It flowers early in the spring and lasts in bloom two or three weeks, during which time it is one of the prettiest of stove plants. Even when out of flower, a well-grown Sonerila is always attractive, its dense mass of small leaves profusely studded with milk-white spots looking like pearls set in bright green. It is a native of India, and in order to grow well requires a brisk heat and a somewhat moist atmosphere. It thrives best in fibrous peat broken small and mixed with about one-fourth of chopped sphagnum, to which a liberal proportion of sand should be added, with a good sprinkling of crocks.

It strikes readily in the spring from pieces of the shoots inserted in small pots half full of crocks, the remainder being filled up with material such as that already described. The cuttings should be kept moist and covered with a bell-glass in a temperature of 70°; they will root in two or three weeks. When the young plants have got fairly established move them into larger pots or deep pans, as to get a good specimen in the least time its branching procumbent shoots should have room to spread over the soil, into which they will root, and in this way cover a much larger surface than they would do if only supported from the stem first rooted. The soil through the growing season should be kept moderately moist, but not too wet. Syringe once a day, but only in bright weather, so that the moisture may dry off them soon, or sometimes the shoots will damp if the water hangs on them too long. To counteract this the plants should be stood tolerably near the glass, but must be shaded slightly from the sun when the weather is hot; they should have air daily through the growing season, but must not be where the air admitted will dry the atmosphere too much. During the latter part of spring and through the summer the plants will bear a temperature of 70° in the night and 85° by day. Nothing further is required but to give additional pot-room, as this becomes necessary, and reduce the heat as the autumn comes on, and also discontinue shading and syringing. In the winter a night temperature of 60° to 65° will be sufficient. Young plants are preferable to old ones, as the latter sometimes are liable to damp off after flowering; this is more likely to occur if, when the flowers drop, the falling petals are not shaken away, as if left to decay on the shoots they will cause them to rot. But, independent of this, young plants propagated early each spring are preferable to old ones. There are three varieties of this plant—S. margaritacea, S. margaritacea alba, and S. margaritacea superba, similar in habit, but differing in appearance.

INSECTS.—Scale, mealy bug, and other insects will sometimes attack Sonerilas. Those that can be destroyed by fumigation are easily got rid of by that means, but the scale and mealy bug are difficult to deal with when they get established on the brittle stems and leaves, which are impatient of any but very gentle handling; and, like other plants with delicate foliage, they will not bear the use of insecticide, sponge and water being the best means by which to clean them.

SPARMANNIA AFRICANA.

A handsome flowering evergreen greenhouse plant that grows to the height of a small tree in its native country, but blooms freely in a small state under cultivation. The flowers are quite distinct from those of most other things; they are produced in large bunches at the extremities of the shoots, and last for a considerable time in fresh condition. The plant strikes freely from shoot cuttings in spring, put singly in small pots in sand, keep moist, close and shaded in a temperature of 70°. As soon as well-rooted give more air, and in a few weeks they will require moving to 6-inch pots. It does well in good ordinary loam, to which has been added some rotten manure and a good portion of sand. Keep the young plants in a growing temperature similar to that in which they were struck until they get to moving freely, when reduce the heat to that of an ordinary greenhouse. Stop the shoots when they have made a little progress—the plant has an erect habit and requires attending to in this respect. By midsummer more root-room will be required; it is a free grower, and 10 or 12 inch pots will not be too large; the soil now used should be in a lumpy state and contain more manure. Again stop the shoots, tying them well out; all through the growing season give plenty of air and light, with a little shade in very bright weather, and syringe well in the afternoons before taking the air off. When the flowering is over cut the shoots back freely and keep the soil drier, wintering in a temperature of 40° by night. In spring turn them out of the pots, removing part of the soil, and give others a size larger. The plant will last for many years if well attended to. It comes from the Cape of Good Hope.

INSECTS.—Most of the insects that are troublesome on indoor plants will live on this Sparmannia; the frequent syringing advised will keep down red spider and aphides. If scale affect it syringe with insecticide.

SPHÆROGYNE.

These handsome stove Melastomads are remarkably distinct plants, especially S. latifolia, which is much the finest and most desirable species to cultivate. In appearance it is like Cyanophyllum magnificum, but its leaves, although not nearly so large as those of the Cyanophyllum, are more beautiful; the colour of the upper surface is a shade of olive-green, shining like velvet; their beauty is much heightened by the singular corrugation which extends in a complete network over the whole leaf, imparting to the plant a particularly handsome and unique character. Besides S. latifolia there are two or three other kinds in cultivation—S. ferruginea, S. imperialis, and S. cinnamomea; the latter comes from Costa Rica, S. imperialis from Peru, and the two first-named from South America. All are alike as to their cultural requirements, and a high temperature is necessary to grow them well. They are easily increased and are free growers, thriving in either loam or peat, the latter to be preferred where it can be had of good quality. They can be propagated at any time of the year when cuttings in a half-ripened condition are obtainable; these may consist of the top leading shoot taken off with about three joints, or of side shoots such as are produced by a plant that has had its head removed, say in April. By the beginning of June it will have pushed out side shoots; if these, when big enough, are taken off at a joint and put singly into 3-inch or 4-inch pots filled with sandy peat, the surface all sand, kept moist, shaded, and close under a propagating glass in a temperature of 70° or 75°, they will root sufficiently in three weeks or a month to bear the glass being dispensed with. After this keep them where they will get a fair quantity of light in a house or pit where the atmosphere is moderately humid, giving some air in the daytime, and shading always when the sun's rays come on them. They should now have heat in the night time, like ordinary hot stove plants, with 80° or 85° in the day. They are free rooters, and by the middle of August will require moving into pots 6 inches or 7 inches in diameter; use soil with plenty of vegetable fibre in it, and a moderate quantity of sand and some rotten manure. They should be syringed once daily all through the growing season, getting the water well to the undersides of the leaves, so as to prevent the lodgment of thrips or red spider. Reduce the temperature in the autumn, leave off shading, and regulate the admission of air in accordance with the state of the weather. The night temperature during the winter should not be under 60° or 65°, and it ought to be gradually increased from the end of February through the spring until it reaches the point advised for last summer. In March move the plants into 12-inch or 13-inch pots, in soil similar to that used for the last potting. Treat as to shading, air, and atmospheric moisture as in the last season, and give plenty of water to the roots as these fill the soil. If large specimens are not required, liquid manure will sustain them through the season in the pots they now occupy, but if the intention is to grow the plants as large as possible, they will by midsummer require 15-inch or 16-inch pots. After this they will reach a handsome size, and only want a continuance of the treatment so far advised. The only form of growth which shows these Sphærogynes to advantage is keeping to a single stem, and they are only attractive so long as they retain their lower leaves in good condition; consequently when these are getting shabby, the plants should be headed down, and afterwards kept warm. The stools will soon break, when most of the soil can be shaken away, and they should be put into pots that will admit the roots with some new material; treat afterwards as recommended in their younger state. It is well to keep a succession of young plants to take the place of the old ones, which can then be dispensed with as their foliage gets into bad condition, but where large examples are required the headed-down specimens will make the finest, forming larger leaves near the bottom than cuttings will.

Insects.—All the insect pests that affect stove plants will live on Sphærogynes, especially scale and mealy bug, from which they should always be kept quite clear, as the formation of their leaves gives harbour to the insects, and makes it difficult to remove them without injuring the foliage, which is impatient of sponging unless great care is exercised.

SPIGELIA SPLENDENS

An herbaceous perennial that will live in a greenhouse, but is better accommodated with intermediate heat. Its red, tube-shaped flowers, produced in summer on a considerable length of the shoots, have a pretty effect.

It can be struck from shoot cuttings put in during spring, and treated in the usual way, and afterwards grown on under the conditions already mentioned of moderate heat, with plenty of air and less moisture in the atmosphere than most of the stove occupants require, otherwise the growth is liable to get drawn and weak. It comes from Costa Rica.

Insects.—Aphides are often troublesome in the summer on this plant; for these fumigate.

STATICE.

Among the whole family of greenhouse plants there are probably none more useful, or worthy of cultivation, than these, whether for general decorative purposes or for exhibition. There are several points required to make up the properties essential to a really useful flowering plant. It should be moderately easy to grow, and of free-blooming habit, if the flowers last long all the better; it should be neither very slow in growth, nor so free as to outstrip reasonable bounds in a comparatively short time. Greenhouse Statices possess these qualities to an extent that few other plants

Statice Profusa

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can boast of; hence their increased popularity. The varieties under consideration bear flowers of a dry paper-like texture, and may almost come under the description of Everlastings. The leaves are large—in some of the varieties from 8 to 12 in. in length by 4 or 5 in breadth. The wood is somewhat soft for a considerable period after it is formed and until the time when it becomes bare of leaves—which the bottom parts of the branches do as the points of the shoots extend—after which it gets very hard. The flowers of the different varieties here treated of are produced in large bunches, on stout woody stems, and have a calyx varying in colour from blue to pale lilac (which gives a lively and novel appearance) and a white corolla; this latter soon perishes, while the calyx is long enduring.

The time of flowering varies considerably, according to the treatment the plants receive, but most of the kinds under notice throw up their principal blooming stems early in the spring, and continue through the season as they grow to push additional flowers, which keep on until autumn. The individual blooms, if they are not allowed to get wet, and the plants are not placed in a moist atmosphere, last good for two or three months; if cut when newly opened, and dried quickly, they lose little of their colour, and may be used in vases for room decoration many months, or even years, if kept under a glass shade free from damp. Statices enjoy a little closer atmosphere than most greenhouse plants, and do not like full exposure to the sun, their broad, leathery leaves offering a considerable evaporating surface; if too much exposed to its influence they assume a bronze-like, sickly appearance, and become a prey to red spider, but, on the other hand, they must by no means be kept too confined, with little air, or far from the glass, or they will not succeed. In winter they require more warmth than most greenhouse plants, and should be kept in a night temperature of about 45°. It is scarcely necessary to say that they must never be placed out in the open air, as it is needful to do with many things in the summer in order to ensure that their growth should be fully matured, as the flowers are produced from the young shoots as they are formed. In selecting plants choose such as have several breaks not more than 3 or 4 inches above the surface of the soil, for if they have run up high there is no means of getting the lower branches down to keep the base of the plant well furnished, for the shoots are stiff, and until they have extended considerably—which it takes years for them to do—there is difficulty in bending them. Reject any that have been too long confined in small pots, for the plants are remarkably free rooters, and unless moved on as the roots require space they get into a stunted condition, in which case a newly-struck cutting would be better, and with liberal treatment progress at such a rate as to leave a pot-bound plant behind.

They root readily from cuttings made of the shoots in spring; select such as are of moderate strength, and not too hard to make roots, and remove the lower leaves. Cuttings should be inserted singly in small pots three-parts filled with a mixture of sand and loam in equal parts, the rest all sand; cover with a bell-glass, keep moist, shaded, and moderately close in a genial heat, such as that of an intermediate house. Here they will soon strike, after which remove the glass and keep in a growing temperature through the summer, a little closer than that of a greenhouse, with shade, syringing overhead in the afternoon. About the end of July move into pots 2 inches larger, now using soil with less sand in it; in autumn give more air, and cease shading and syringing: keep them through the winter in a temperature of about 45°. If they can be accommodated with a shelf near the roof all the better, as the more light they receive in such a situation the stouter and stronger will they grow. So treated the roots will be fully active through the winter, the heads of the plants also making growth—a condition essential to the well-being of all the varieties in every stage of their existence.

If Statices are treated in the winter so as to induce a total cessation of growth, or rest as it is generally termed, by being kept in a low temperature, not only is there loss of time in getting them up to a useful size, but they are much injured, such usage inducing a stunted condition, and the growth for the ensuing year's flower is not made by the time it should be. This will be looked upon as the opposite of sound practice by those who act on the principle of resting all plants through the winter in something like a uniform manner, but it is this indiscriminate treatment of things collectively that is the cause of many growers not succeeding with quantities of subjects that they attempt to cultivate. There are many plants, and these Statices are among the number, that do not need rest in the ordinary acceptance of the term; it must not be understood that it would be advisable or possible, with a view to health in either these or other things of similar nature, to keep them on growing through the dormant season at the same rate as in summer, but they require to be kept moving even in the winter much more than many plants do, or success will only be partial. In March move into 6-inch pots, using the loam now with more vegetable fibre in it; keep closer for a few weeks, shade in the day when sunny, and again use the syringe overhead to keep the material on which the pots stand damp. After the plants begin to move freely give more air than in the previous summer, but in other matters treat as before; as autumn advances dispense with shade and the use of the syringe, and winter in a temperature similar to the preceding, giving less water to the roots than in the summer, but never letting them get so dry as the generality of hardwooded plants require to be in the dormant season. About the beginning of March plants managed as above directed will be in a fit state for moving into pots 2 inches larger. They do the best in good yellow turfy loam, not broken too fine; nothing should be added to it except enough sand to keep it in a healthy porous condition. Statices require much more water than many occupants of the greenhouse, and consequently they must be well drained. In potting make the new soil quite firm, and place them for a week or two where they will be a little close; do not give too much water until the roots enter the new soil, but this advice must be accepted in a qualified sense, as they should never be allowed to get so dry as necessary for the well-being of many hardwooded things. Keep them near the light, but away from cold currents, and as the sun gets more powerful they will require a slight shade during the middle of the day, but never let it stay on longer than needful. Throughout the summer syringe overhead in the afternoons, getting well under the leaves to keep down spider, which, if allowed to establish itself, will soon do serious harm. They will continuously through spring and summer keep throwing up flower-stems, which at present it is advisable to remove as soon as they make their appearance. The nature of the plant's growth does not admit of stopping, as in most things, neither is it necessary, for almost every flower-stem that is made divides in two the point of the shoot whence it springs, and by this means the plants, as growth proceeds, get fully furnished. In the hot summer weather they will make more progress stood on a bed of ashes or similar material than upon a dry shelf, as if not placed on some medium that can supply a moderate amount of moisture around them they suffer more than most things, as from the natural structure of the leaves evaporation is very great. As autumn approaches discontinue the use of the syringe and give plenty of air. Winter as advised the previous season, and if any flower-stems are made before spring remove them as they appear. In March again pot on; now give a 3-inch shift, and use the soil a little more lumpy, and treat them this season as in the previous in every respect except that where it is not the object to get the plants on in size without delay they may be allowed to flower, as they will now be very useful for decorative purposes in the conservatory or elsewhere. When in bloom they must not be syringed, as the least moisture will cause the flowers to damp, but when used in this way while young they should not be kept so long out of the growing house or pit, neither must the successional flowers that will from time to time make their appearance be allowed to remain or they will interfere with the growth. As the shoots lengthen sufficiently bring them down a little towards the rim of the pot—for this purpose a few sticks will be required. The shoots are very liable to split out from the point whence they spring if much bent; to prevent this they should be secured by a ligature of bast bound round the point of the juncture, which should be allowed to remain on for a short time after they are trained. Give treatment through the summer, autumn, and winter similar to that before advised. In spring pot about the same time, giving again a 3-inch shift; the plants will this summer, if all goes well, make nice half specimens, and should be allowed to flower until midsummer, after which remove all the blooms on them, as also all that push through the autumn, and encourage growth by attention as up to this point directed.

In potting the following spring they will require 18-inch pots; in these they may remain for two years, and should be given weak applications of manure-water once a week through the summer. When again moved into pots a size larger they can be kept in these for several years by a liberal use of liquid manure, which will sustain them in a healthy state. They may now be allowed to flower all through the summer. None of the varieties are liable to go off suddenly, but it is well to keep a few young plants in hand to take the place of the larger ones as they get worn out. They do not want much training further than keeping the branches a little open, as they do not bear being much bent; but the flowering shoots while young and pliable should be regularly tied out, so as to form neat, shapely heads.

S. brassicæfolia. Is a large-leaved kind of erect habit. It is a good useful decorative plant. From the Canaries.

S. Butcherii. A fine, deep-coloured variety, of stout erect habit of growth. This we consider the next best variety to S. profusa.

S. Holfordii. Also a large-leaved variety, and an upright grower. The flower-stems are not produced in such profusion as in some of the others, but are bigger and more branching.

S. imbricata. A strong-growing, free-flowering sort, with a somewhat upright habit. Teneriffe.

S. profusa. For general purposes this is the best variety; it is a branching, dense-habited sort, a very free flowerer and a good grower. A garden variety.

INSECTS.—Most of those that infest pot plants will live on these Statices, especially aphides, thrips, and red spider, all of which soon do serious mischief if allowed to remain undisturbed; the two former can be destroyed by fumigation, the last is best kept down by a liberal use of the syringe, and if much affected give a good washing with insecticide, not too strong.

STAUNTONIA LATIFOLIA.

This is the only species of the genus known in this country. It is a free-growing evergreen greenhouse climber of secondary merit, succeeding with treatment like that advised for the strong-growing kinds of Kennedya, which see.

The flowers are a mixture of lilac and green. It comes from China, and usually blooms in spring.

STENOSPERMATIUM WALLISII.

In this we have a stove Aroid, which appeared as Spathiphyllum Wallisii, and is still sometimes met with under that name. Like many others of the order to which it belongs it is more curious than handsome; the spathes are white.

It will grow in material such as is recommended for Anthurium Scherzerianum, which see; similar to the Anthurium it likes plenty of water when growing, and a free use of the syringe daily overhead. When at rest it must be kept drier at the roots, but not so much as to cause the leaves to become flabby. It comes from Colombia.

STEPHANOPHYSUM BAIKIEI.

This is a useful winter-flowering Acanthad, and although it can only be accounted as holding a secondary place to some of our best winter-blooming plants, still, on account of its free-flowering disposition and its coming in during the dull season, it deserves to be more generally grown than it is at present. The flowers are tube-shaped, red in colour, and produced in sufficient quantity to make the plant effective.

It will succeed under treatment such as advised for Eranthemums, which see.

INSECTS.—Aphides sometimes attack the young shoots, and should be met by fumigation; the plant does not seem to be much subject to other insect pests.

STEPHANOTIS FLORIBUNDA.

There are few plants that have so many good properties as this well-known fragrant favourite—easily grown, a profuse bloomer, the flowers opening in succession over a considerable period, and lasting well individually. From the time it first became sufficiently known it has always been admitted as one of the best of all bouquet flowers, its pure white, long, tubular blooms arranging admirably with anything else. Those who grow flowers for the London market treat it so as to have a long succession of bloom. Even a single plant, when it has attained a considerable size, will keep on flowering for several months. It will grow in either peat or loam, but as it does not like to be shaken out or to have its roots disturbed often, it is better to grow it in loam, as this will last longer than peat. It strikes freely from cuttings made of the preceding season's shoots, using portions that have not got too hard. If cuttings consisting of a couple of joints of these are, during the winter, put in thickly in 5 or 6 inch pots and stood in a temperature of 60°, they will callus over in a few weeks, when they may have 10° more warmth, which will enable them to root freely, or young shoots such as break from the old stems in spring may be taken off when 8 or 9 inches long with a heel of the old wood. These, if kept a little close, and in a temperature similar to that mentioned for cuttings of the mature wood, will root directly. When well rooted put them singly in 4-inch pots in good fibrous loam, with sand added, according to the nature of the soil. They will grow away if kept in a temperature of 60° or 65° in the night with a rise by day. It is of twining habit, and as soon as the plants begin to grow they will require a stick to each to support them. When the shoots have reached a couple of feet in growing through the dormant season at the same rate as in summer, but they require to be kept moving even in the winter much more than many plants do, or success will only be partial. In March move into 6-inch pots, using the loam now with more vegetable fibre in it; keep closer for a few weeks, shade in the day when sunny, and again use the syringe overhead to keep the material on which the pots stand damp. After the plants begin to move freely give more air than in the previous summer, but in other matters treat as before; as autumn advances dispense with shade and the use of the syringe, and winter in a temperature similar to the preceding, giving less water to the roots than in the summer, but never letting them get so dry as the generality of hardwooded plants require to be in the dormant season. About the beginning of March plants managed as above directed will be in a fit state for moving into pots 2 inches larger. 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If cuttings consisting of a couple of joints of these are, during the winter, put in thickly in 5 or 6 inch pots and stood in a temperature of 60°, they will callus over in a few weeks, when they may have 10° more warmth, which will enable them to root freely, or young shoots such as break from the old stems in spring may be taken off when 8 or 9 inches long with a heel of the old wood. These, if kept a little close, and in a temperature similar to that mentioned for cuttings of the mature wood, will root directly. When well rooted put them singly in 4-inch pots in good fibrous loam, with sand added, according to the nature of the soil. They will grow away if kept in a temperature of 60° or 65° in the night with a rise by day. It is of twining habit, and as soon as the plants begin to grow they will require a stick to each to support them. When the shoots have reached a couple of feet in height remove two or three of the top joints to cause the production of two or more growths. The plant comes from Madagascar and can stand a good amount of heat; consequently, through the summer months it will bear a temperature of 65° to 70° by night, with from 70° to 80° in the day. It likes a somewhat drier atmosphere than some stove subjects—that is, it does the best with a liberal admission of air in the daytime so as to permit of the air of the house getting drier than where less is given. It requires no shade further than is found necessary to keep the leaves from scorching. If by the beginning of July the pots are found full of roots move into others a couple of inches larger. Syringe the plants in the afternoon during the growing season until September, when give more air and reduce the root moisture as well. From 55° to 60° night temperature will answer through the winter, with just as much moisture in the soil as will keep the leaves from shrivelling. About the beginning of March raise the temperature, and increase it still further as the sun gets warmer. Give more water to the roots, and as soon as growth has commenced move into pots 4 or 5 inches larger, using loam, which should be of such a good turfy character that it will not soon decompose. Ram the soil quite firm, and either fix trellises on the pots whereon to train the shoots or run them up wires or strings over the roof if intended to be grown in that way. Before the shoots begin to grow stop the points to cause them to break. The young growth will most likely produce some flowers, but the principal object this second season should be to get the plants as large as possible, for upon the size and strength they acquire, and their being well maintained, will depend the quantity of bloom they make the ensuing year Treat in every way as in the preceding season, keeping the shoots regularly trained. If this is not attended to they get so entangled that they cannot be regulated afterwards. Give plenty of air through the latter part of summer and autumn, with a drier condition of both atmosphere and soil, so as to get the growth fully matured. Winter as before. Do not reduce the shoots at all previous to the commencement of growth, and if all goes well the plants will produce a large quantity of flowers. When the blooming is over the shoots may be shortened back, and pots from 4 to 6 inches larger should be given. Treat during the summer as previously, and also through the autumn and winter. The pots to which the plants were last season moved will be large enough for the next two years, giving manure-water at the time of active growth. Cut the shoots back so far as necessary after blooming, as advised the preceding season, and treat as before. The plants will last for many years if a few inches of the surface soil be removed and replaced with new. Although we have spoken of their being grown on trellises in specimen fashion, they do better close under the roof near to the glass, and even if they are wanted to bloom on the trellises the shoots should be trained near the glass during the growing season, and then wound round the trellis when fully matured. But in no way is the plant seen to so much advantage as where permanently trained under the roof, and if, in addition, it can be planted out in a bed of well-prepared soil 3 or 4 feet square, it will keep on growing and flowering for many years. Where there is plenty of room for the head to run, a plant will continue blooming for months.

INSECTS.—From the leathery texture of the leaves Stephanotis is not liable to the attacks of such insects as aphides and red spider, and if these make their appearance they are easily removed by syringing. The worst pests, like scale and mealy bug, are however very partial to it, and should these affect it a thorough dressing with insecticide ought to be given when the plants are in a dormant state during the winter; repeat the dressing so as to make sure of destroying not only the mature insects, but also their eggs.

STRELITZIA.

These showy Cape plants are generally classed as stove subjects, but they will thrive in a greenhouse in summer and do with a little more warmth in the winter than ordinary cool greenhouse plants need. An intermediate temperature suits them best. Some half-dozen kinds may be met with in cultivation, but they do not differ very materially from S. Reginæ, which has purple and yellow flowers. The Strelitzias are evergreen herbaceous plants of stately appearance; their season of blooming is ordinarily in the summer and autumn. S. Reginæ bears its flowers on stout erect stalks, which attain a height of 3 feet or more, according to the strength of the plant and the heat to which it is subjected; the flowers are very distinct and curious in form, and last in perfect condition two or three weeks.

Strelitzias are mostly propagated from suckers, which are produced after flowering in the manner usual with plants that increase in this way; when these have attained a considerable size they can be divided from the parent plant—during the spring or summer, so as to get established before winter—and put in separate pots, drained and filled with good fibrous loam with which some sand has been mixed. The pots used should be such as will suffice to hold the considerable quantity of roots which the suckers ought to have before their removal from the plants that have produced them. Pot firmly, and stand them where they will get some warmth that will assist their making new roots; the thick leathery texture of the leaves is such that no shade is required, not even when the sun is most powerful. All that is needed to grow them well is to give sufficient air, with water as they want it, and enough pot-room proportionate to the size of the plants, for they may be either kept to single crowns or allowed to remain entire until a number are formed, but for most purposes medium-sized examples, such as those composed of three or four crowns each, will be found the most desirable. Large specimens can be divided into portions varying in size to meet the requirements of the cultivator, all that is necessary being that when the division is effected the several pieces should, as soon as potted, be placed where there is warmth enough to set them growing immediately, otherwise the roots they already possess are liable to rot.

INSECTS.—The natural consistency of the plants, stems, and leaves combined, is such as to offer little attraction to insects, though aphides often establish themselves on the young leaves; they can be easily removed by sponging or fumigation; if affected with scale sponging is the best remedy.

STREPTOCARPUS.

Herbaceous perennial Gesnerads that thrive under cool stove treatment. The best known is S. Rexii, often grown under the name of Didymocarpus Rexii. They bloom over a lengthened period through the summer and autumn. Few plants are so easily managed; they can be raised from seed sown in the spring in moderate heat, potted and grown through the season under the usual conditions of air and root moisture, with plenty of light and a little shade in sunny weather. They do well in turfy loam with a little leaf-mould and sand added; plants such as can be grown in 6 or 8 inch pots will usually be found more useful than larger examples. They can also be increased by division of the crowns, which should be effected in spring just as growth is about to commence; treat them afterwards like the seedlings.

S. polyanthus. A pretty blue-flowered kind that blooms in the summer. A native of Natal.

S. Rexii. An abundant bloomer, the flowers are slate-blue in colour. It comes from the Cape of Good Hope.

S. Saundersii. A singular-habited species, with pale purple flowers produced freely. A summer bloomer. From Natal.

INSECTS.—Aphides are often troublesome on these plants, getting to the undersides of the leaves and on the flowers; fumigating is the best means for their destruction.

STYPHELIA.

Low-growing evergreen shrubs that bloom in summer; not equal to many of similar character. They are not much cultivated at the present time.

They will thrive under treatment such as advised for Epacris, which see.

The undermentioned are the most desirable:—

S. epacrioides. Has crimson flowers, produced in summer. From New Holland.

S. latifolia. Flowers pink, blooms early in summer. From New Holland.

S. tubiflora. Flowers scarlet, blooms in summer. A native of New South Wales.

SWAINSONA.

These handsome flowering evergreen greenhouse plants are natives of New South Wales, and are deserving of general cultivation; they bloom freely from July to September, coming in at a season when flowering subjects are not over-plentiful. They are of somewhat straggling habit, very distinct from most others that require similar treatment as to soil and temperature; they continue for many weeks to open a succession of flowers, produced in bunches from the current season's wood. This continuous blooming habit renders these Swainsonas especially useful for conservatory decoration, although those who want flowering plants for exhibition during the latter part of summer will find them of service. They are free growers, and will succeed well in a mixture of peat and loam, in equal proportions; or, if peat cannot be had of good quality, they will grow in loam, particularly if it contains plenty of fibre, so as to maintain it in a healthy state for some years; this is always an important condition, that cannot be too often impressed upon those who have not had much experience in the cultivation of things of this kind. It frequently happens that a certain soil, either peat or loam, will answer for a time, but soon gets into a state that precludes the possibility of the plants grown in it keeping in health, and when into soil of this nature are put things that do not well bear a partial shaking out and a renewal of the material in this way, an unsatisfactory condition is sure to follow.

If towards the middle of March the soft points of the young shoots, in about 3-inch lengths, are taken off a plant that has been kept through the winter where a little growth has been made, and put singly in small pots in sand, kept moist and shaded, under propagating glasses in an intermediate heat, they will soon root. Then gradually dispense with the glasses, and as soon as the shoots begin to grow pinch out the points; keep through the summer stood on a moist bottom, and give more air in the middle of the day as the young plants get better established. By the end of July move them into 3-inch pots, using peat made moderately fine with a little sand added; keep the atmosphere somewhat closer for a week or two until the roots get to work in the new soil, and syringe overhead all through the growing season daily. Give more air in autumn and cease shading; winter at about 45°, and in March repot, giving a 3-inch shift, and now using a mixture of peat and loam, with some sand. Again pinch out the points of the shoots; treat as in the previous summer as to a moist medium on which to stand the pots, a little shade in bright weather, and syringing overhead at the time of closing the house, but give more air in the day. Stop the shoots once more in July, and tie them out to small sticks; keep drier with more air in autumn. Winter as before, and about the beginning of April move into larger pots; if they have plenty of healthy roots they will bear a 3-inch shift. They are not delicate-rooted subjects, but they require efficient drainage and a porous soil: for this reason add one-seventh sand, which incorporate evenly with the soil. Swainsonias like tolerably hard potting, consequently use the potting lath freely, so as to make the soil firm. If the plants have any straggling shoots they should when potted be shortened back; at the same time tie them well out, so as to induce the lower eyes to break; if this is not done with these plants nothing but the topmost eyes will break, and there will be no possibility of their acquiring sufficient shoots to furnish the future specimens properly. After potting use no more water for two or three weeks than may be requisite to keep the ball from getting too dry; let the atmosphere be a little close until they begin to root, have the stage on which they stand moderately moist, and damp the plants overhead every afternoon. Continued and free use of the syringe is necessary all through the summer season, not alone to promote growth, but to keep down red spider, which is liable to become troublesome if enough water is not given overhead. Swainsonas will flower in a small state if allowed, but it is not advisable to let them bloom this season, as they would not make enough for it to be worth while sacrificing the growth which flowering would prevent being made; consequently, all the shoots should have their points pinched out about the beginning of June, and the strongest should be again tied down. This is essential, as these plants are apt to push much of their strength into a portion of the shoots, leaving the remainder weak; but by keeping these stronger ones tied out the strength becomes equalised. In very bright weather they will be benefited by a little shade. About the beginning of August again go over them, and stop any shoots that are taking the lead. Continue the use of the syringe until the middle of September, when the advent of cooler weather will render it not necessary. Through this and the preceding month admit air freely to mature the growth before the autumn gets too far advanced. All through the growing season give sufficient water, as when in active growth they require more moisture in the soil than some plants, but from the time in the autumn when they cease to make much progress, and during the winter, apply only enough to keep the soil slightly moist. Winter in a light house in a temperature of 40° in the night. Again repot about the same time in the spring. This season they will do with a 4-inch shift, and the soil should now be a little more lumpy, but still made open and porous by sand. Stop the shoots, and use a moderate number of neat sticks to keep them in their places, and afterwards for training them to. After potting treat as in the preceding year as to syringing, air, shade, and water at the roots. The shoots must not be again stopped, but as they advance train them to the sticks, in which position they will begin to flower about July, when the plants can be taken to the conservatory, where they may remain until the blooming is over, when they should be at once cut in moderately, placed in their winter quarters, and treated as before. Give 3 or 4 inches more pot-room in the spring, according to the quantity and condition of the roots. No stopping of the shoots will be required this season, but they should be trained regularly to the sticks, and treated through the summer and autumn as previously.

If it is not deemed desirable to grow the plants into large specimens, they may the ensuing spring, and for a year or two following, be kept in a good flowering state by the use of manure-water; in this case it should be supplied regularly every other time or so that they require water, but it must not be given too strong.

The following varieties are worth a place:

S. coronillæfolia. Purple flowers.

S. galegifolia. A handsome red-flowered kind.

S. galegifolia alba. A white-flowered form of the above.

S. Osbornii.

S. Rollissonii.

INSECTS.—For aphides, which sometimes attack the young growth, fumigate. As already mentioned they are liable to red spider, but the continued use of the syringe recommended through the growing season will, if persisted in, always keep them clear from this pest. If they become affected with scale, these must be kept under by sponging and the use of a soft brush.

TABERNÆMONTANA CORONARIA FL.-PL.

This plant is a native of India, whence it was introduced about the latter part of the last century. It is a hardwooded, compact-growing evergreen stove species, which forms a dense bush, and requires little training; the foliage is handsome and of medium size; the flowers are beautifully white, in form not unlike those of a Gardenia, and very fragrant; a small plant will completely fill a large house with its exquisite perfume, which by many is preferred to that of the Gardenia, being less powerful. It is easily propagated and as easily grown, but it will not succeed without stove heat. The flowers are scarcely surpassed by any in cultivation for bouquets. It strikes from cuttings made of the young shoots, when these have attained a length of about 4 inches or 5 inches, taken off with a heel. Under proper stove treatment such shoots will be obtainable by the beginning of April, and if placed five or six together in pots just large enough to hold them in sand, kept moist, covered with a propagating glass, and stood in a temperature of 70° they will root in a few weeks. They should then be moved singly into 3-inch pots, using good turfy peat, to which add as much sand as will keep it in a permanently sweet condition, as, in common with several other comparatively slow-growing evergreen plants, it does not like the shaking-out process from time to time rendered necessary when soil that soon becomes decomposed and adhesive is used. This plant will grow in loam, but in it the foliage will be somewhat paler in colour than when peat is used.

Keep the young plants in a moderately confined atmosphere for a week or two after potting off, gradually exposing them to the air of the house; shade from the sun during the middle of the day. In summer they will succeed in a temperature of from 60° to 65° at night, with 10° or 15° more by day in bright weather; give air in the daytime proportionate to the heat of the weather, and syringe overhead ever day at the time the house is closed. When a little progress in growth has been made pinch out the points of the shoots. By the middle of July pots 2 inches larger will be required. Continue the same treatment as to heat, shade, and moisture until about the middle of September; then give more air and discontinue shading as well as syringing. For the two last months in the year and until the beginning of March a temperature of 60° at night, with from 5° to 10° more in the daytime will suffice; after this, as the solar heat increases, gradually raise the heat of the house, and as soon as the plants show signs of growth move them into pots 3 inches larger, using peat in a more lumpy state than at the first potting. Any shoots that may grow stronger than the rest should have their points cut out; treat as to heat, moisture, air giving, and shade, as advised for the preceding summer, and if about the middle of July the pots are full of roots move them into others 2 inches or 3 inches larger, after which continue to treat so that they may get established before winter. We should not advise any account to be taken of the flowers that are forthcoming this season, as the object is to get the plants up in size so that they may be able to produce a full complement of bloom the following year. Winter as before. They will now be strong with the pots full of roots, and care must be taken that they do not suffer at any time from want of water—yet it must not be given in excess, or injury will be the result, especially after the flowers are formed, which will usually be early in the winter.

Increase the temperature as before in spring. When the blooming is finished any over luxuriant shoots should be cut back, and the plants moved into pots 2 inches or 3 inches larger, after which encourage them by warmth and a genial atmosphere to make growth, so as to get them established in the new soil. Some flowers will be produced through the early summer months, and the plants, when well managed, generally yield a second full crop about July or August, after which they may have the shoots slightly shortened again, which will have the effect of keeping them close and bushy. By the end of September they may be gradually induced to a state of rest, as in the preceding season. The subsequent treatment will require to be such as before advised, giving a little more root-room as required. Weak manure-water once or twice a week will be beneficial. After they have got into pots as large as are deemed requisite, the plants will last for years if each alternate summer after blooming the upper portion of the ball of soil is reduced, and replaced with new. If they get too tall they may be cut back freely after flowering, and as soon as new growth has commenced they should be partially shaken out, returned to the same or a size smaller pots, and encouraged to make growth as when younger.

T. coronaria is a single-flowered form of the above, differing little from the double kind except in the number of petals, and requiring similar treatment in every way. East India.

INSECTS.—Tabernæmontanas are liable to the attacks of mealy bug and scale. When these make their appearance means should be taken to extirpate them, for if present at all the continual cleaning required to keep them down often injures the leaves, and causes the flower-buds to fall off.

TACSONIA.

These splendid evergreen greenhouse climbing plants are very nearly allied to Passifloras, and are among the very finest flowering subjects we possess for draping the roofs of greenhouses and cool conservatories. They are of vigorous habit, and grow rapidly, covering a large space in little time, and are particularly adapted for large houses or heated glazed corridors, where there is plenty of room for the development of their numerous pendent shoots, which, clothed with the immense number of finely-coloured flowers they produce, are, thus drooping, seen in the best position. It is not advisable to plant them in small houses, as in such they almost smother everything grown under them, or else have to be so continuously kept cut in that their blooming capabilities cannot be seen to advantage. The roof should be lofty, so that there will be a considerable space intervening betwixt the extremities of their hanging shoots and the heads of the plants that stand on the stages or floor of the house, otherwise the drooping growths have a confused appearance, and the flowers are not so effective.

Tacsonias are not at all adapted for growing in pots in the ordinary trained specimen style, their habit being too free to be kept within such bounds; but where the roof or wall space which they are intended to cover is insufficient to give scope for the full development of the plants, if allowed, proportionately, too much root-room, they may be grown in a large pot or box. In this way they can be confined to less space without further resort to the knife than is consistent with the production of bloom in sufficient quantities.

The different greenhouse species most worthy of cultivation bloom continuously for a considerable period through the summer and autumn, when indoor flowers are somewhat scarce; they are very useful for cutting to decorate large stands, or entwined round the stem of a vase; when so arranged, or hanging down over the sides, they have an elegant and pleasing appearance that cannot be produced except by the use of things similar in habit. Loam is the most suitable soil in which to grow them, and it should be of a good mellow nature, containing plenty of fibre, for on this will depend its lasting properties. The border in which the plants are to be grown should be proportionate in extent to the space they are intended to cover.

Most of the varieties can be increased from seeds and by cuttings which should consist of young shoots, such as produced in spring from branches that have been cut back; these ought to be taken off with a heel as soon as they have grown to a length of about 4 or 5 inches, and put singly in 3-inch pots, drained and half filled with a mixture of loam and sand, the surface wholly sand; kept close, moist, and shaded, in an intermediate heat, they will form roots, when give more air. Stand them during the summer on a moist bottom, syringe each afternoon when the house is shut up, and give a little shade in the day; in this way they will grow so as to require pots 3 inches larger in July. Winter in a temperature of 45° or 50°, and about March move them into 8 or 9 inch pots; use the soil moderately fine with some sand added, and put to each plant three or four sticks round which to train the shoots. A slightly closer atmosphere than that of a greenhouse will be all that is required this summer different from the treatment given to greenhouse plants generally; syringe when the house is closed, and train the shoots round the sticks as they require it; give more air in autumn, and winter at about 45°. The plants ought to be turned out in the spring, before growth has commenced, so that the disturbance of the roots in opening them out to spread them evenly in the border will not cause a check, which would occur if planted after growth had begun. If the roots are covered 3 or 4 inches deep it will be enough. Do not give more water than will keep the soil in a moderately moist state until growth has made some progress. The shoots should at once be trained in the place they are to occupy; as to stopping this will depend upon the situation—if to cover a back wall the shoots must be stopped sufficiently to cause them to break enough to furnish the whole from the bottom gradually upwards. If this is not attended to in the first instance it will cause trouble afterwards. If the object is to furnish a portion of the roof, it will be better to confine the plant to one or two shoots until these have reached the top of the upright glass, when they must be stopped to induce them to make as many growths as required. These should be regularly trained in their places until the whole is covered. The plants will of course be subject to such treatment as to air, heat, and atmospheric moisture as may be required by the other occupants of the house; they need but little shade, but they should all through the growing season be regularly syringed overhead in the afternoons during warm weather. When the desired space is filled the shoots ought, each autumn after they have done flowering, to be well cut back. Strong vigorous growing plants such as these soon exhaust the soil, to remedy which a few inches should, in the spring, be removed from the surface of the border and replaced with new, in addition to which they ought to be regularly assisted with manure-water.

The undermentioned are all desirable kinds:—

T. Buchananii. Scarlet.

T. eriantha. Similar in colour to T. mollissima. South America.

T exoniensis. Brilliant rose, with violet throat. A garden hybrid.

T. insignis. Bright crimson, a strong grower.

T. manicata. Scarlet.

T. mollissima. Rose colour. Bogota.

T. tomentosa speciosa. Bright red.

T. Van Volxemii. Crimson. New Grenada.

INSECTS. — The constant use of the syringe advised through the growing season will keep down the smaller insects, such as aphides, red spider, and thrips; if they get affected with scale, or mealy bug, there is no resource but the use of sponge and brush during the growing season, and in the autumn, when growth is complete, cutting close in, loosening the plants from the wires, and steeping them repeatedly in a strong solution of insecticide.

TECOMA.

These evergreen greenhouse plants are nearly allied to Bignonias; the climbing kinds are well adapted for draping the roofs of conservatories or greenhouses Their method of propagation and the general treatment are the same as recommended for Bignonias, which see.

The following are all fine kinds:—

T. capensis (syn.: Bignonia capensis). An orange-flowered species; it blooms in summer or autumn. From the Cape of Good Hope.

T. jasminoides. A species with pink flowers; a summer bloomer, from New South Wales.

T. jasminoides alba magna, T. jasminoides rosea, T. jasminoides splendens are handsome forms of T. jasminoides, differing only in the colour of their flowers.

TELOPEA SPECIOSISSIMA.

This magnificent plant, the Waratah of New South Wales, is rarely seen, which in some measure may be attributable to its taking up considerable room. It also requires to be grown where it will have a temperature higher than that of an ordinary greenhouse, but not so high as that usually kept up in the stove; beyond this, to flower the plant a considerably drier atmosphere is indispensable, not only in the dormant season but also during the summer, otherwise the growth as it progresses is wanting in the solidity that is essential to the production of bloom, and which no amount of dry treatment through the winter will make up for. The flowers are produced on the extremities of the shoots in the form of compact, almost globular heads (in outline not unlike an incurved Chrysanthemum), some 4 inches in diameter, and surrounded at the base with a number of large lance-shaped bracts coloured like those of a Poinsettia; the flower heads are scarlet, and, combined with the bracts, have a most brilliant appearance, quite distinct from anything else.

The plant produces suckers freely, and the best method of propagation is by layering these singly in pots in winter when at rest; allow them to remain attached to the parent plant until well-rooted, when they must be severed, and afterwards grown on under conditions of warmth and air, such as already indicated, with plenty of light. In common with other plants from the same country it will bear a high temperature in summer with a dry atmosphere, plenty of sun and no stint of water to the roots, but must be kept as dry in the winter as consistent with an evergreen, the leaves of which would naturally suffer if the drying process was carried too far. A winter temperature of 40° to 45° by night will answer for it; in summer 55° to 60° in the night, and as much as the sun, with plenty of air, will raise it to in the day. When large enough the plants should be turned out in a well-drained bed of good porous loamy soil with a moderate amount of sand in it.

INSECTS.—If troubled with any of the pests that affect plants grown under glass syringe freely with clean water and sponge with insecticide.

TEMPLETONIA.

These are low-growing evergreen shrubs that bloom in spring. Their flowers are pretty, but not so effective as those produced by many of our greenhouse plants.

They succeed with similar treatment to Epacrises, which see.

T. glauca. Has red flowers, produced in spring It comes from New Holland.

T. retusa. Also bears red flowers; it is likewise a spring bloomer, and comes from New Holland.

TERMINALIA ELEGANS.

In this we have an evergreen stove plant from Madagascar, distinct and handsome. Its trifoliate, lance-shaped leaves are not unlike those of some of the Aralias, and are extremely beautiful; the ground colour is deep green, the midrib red, and a red reticulation runs through the whole of the leaves; as they get old this red veining becomes almost as clearly defined and vivid as that of the beautiful Anæctochilus setaceus. It is a plant of medium or small growth, attaining about the same size as Aralia Veitchii, and easily grown where a high temperature can be maintained. It can be propagated by grafting it on any of the Aralias with pithy stems, such as A. Veitchii; it will also grow from root cuttings made from half-inch pieces of the stronger roots, inserted with their ends just above the surface in pots drained and filled with sand in a temperature of 75° or 80°. When raised in this way the cuttings should be put in about the end of March so that the plant from which they are taken can at once be started afresh in a brisk heat; the cuttings as soon as they commence to grow must be stood in a moderately light position. When they have made a few leaves they should be moved singly into 3-inch pots, using good peaty soil with sand added; they will bear through the summer as much heat as any plant in cultivation, say 70° in the night, with 80° or 90° by day in bright weather. Shade from the sun when it is powerful, give air in accordance with the weather, syringe overhead in the afternoons, and keep a moderately humid atmosphere all through the season of growth. Continue to treat in this way until the approach of colder weather, then leave off shading, and keep the atmosphere drier. A temperature of 60° or 65° should be kept up by night in the winter, with less water at the roots, but the soil must never be allowed to get dry, or the foliage of this and all similar plants will suffer. In spring increase the warmth and resume the treatment generally recommended for the preceding summer, giving pots 2 or 3 inches larger as the soil gets filled with roots. Treat through the ensuing winter as in the last, again give larger pots in spring, and manage then through the summer as before. During this, the third, summer the plants will grow so as to be seen to advantage, retaining their beauty as long as the lower leaves continue healthy, after which they can be headed down to within 6 inches of the collar, and when the young shoots have grown to a length of 6 inches reduce them to one, shaking out the soil and moving into pots a size smaller. If the upper portion of the heads only are taken off, the tops may be struck, and the shoots which will break out from the stem can be taken off with a heel and struck in the way found successful in the case of other plants that require a strong heat; treat the young stock thus obtained in a similar manner to that advised for the plants raised from root cuttings.

INSECTS.—The smooth, glossy surface of the leaves does not afford much harbour for insects, so that all which may affect them can be removed by syringing except scale, which is easily got rid of by sponging.

TESTUDINARIA ELEPHANTIPES.

This singular plant is more curious than beautiful; it is a deciduous greenhouse climber with comparatively thin stems that spring from a large, woody-looking mass, as broad and in appearance like the foot of an elephant, hence the name.

Under cultivation the plant produces little from which it may be increased; most, if not all, that exist in this country are imported in a dormant state.

It will thrive planted out, or in a moderately large pot, well drained, in loam or peat, to which a fair quantity of sand is added. Keep the soil dry when at rest, and water freely when growing. The flowers are yellow, produced in summer.

INSECTS.—It should be syringed freely during the season of growth to keep down insects.

TETRATHECA (TREMANDRA).

These pretty, free-flowering greenhouse plants are natives of New Holland and Van Dieman's Land, where they exist as low-growing evergreen under-shrubs. They are quite distinct in their flowers, leaves, and general appearance from any other greenhouse subjects in ordinary cultivation; they are also widely different in appearance from each other in habit and duration of flowering. Both the smooth and the woolly leaved varieties of the Heath-leaved Tetratheca, T. ericæfolia, commence flowering in the winter or early spring, and may be had even up to the end of May, but to have them so late as this they must be especially prepared by retarding the opening of their first blooms. Their innumerable pinkish-lilac flowers, different in character from anything else, make them very desirable for exhibition purposes, and equally so for conservatory decoration, where they will last long; but when used for this latter purpose they should be placed in a good light situation, and not overcrowded among other things that will prevent their receiving all round the light and air necessary for their well-being.

Tetrathecas strike freely from cuttings made of the points of the young shoots in a half-matured state; these should, about the beginning of August, be put an inch apart in pots half filled with a mixture of sand and sifted peat, the remainder all sand, placed under a bell-glass, kept moist and shaded in moderate warmth. They will root during the autumn, when remove the glasses, and as soon as they begin to grow pinch out the points. It will be better to defer potting until spring; keep them through the winter in a temperature of about 48°, close to the glass, with just enough water to keep the soil moist. Towards the beginning of April move singly into small pots in soil composed of fine peat and sand; they should be kept a little close until growth commences, shaded when the sun is bright, and stood on a moist bottom. Give a moderate amount of air in the middle of the day when the roots have got fairly into motion, and treat generally as with other hardwooded stock in a similar stage. By the middle of July move them into 3-inch pots, managing as before until the middle of September, when leave off shading and give more air. Winter in a temperature of about 45°, and in April move the young plants into 5 or 6 inch pots, again stopping the shoots; give less air for a few weeks, with shade and a moderately moist atmosphere. As soon as root growth has commenced admit more air, which will require to be increased this season as the weather gets warmer, still shading when it is very bright, and syringing overhead at closing time in the afternoons; be careful to see that they do not want for water at the roots, and keep the material on which the pots stand moist until the growing season is getting advanced, when give more air and winter in a similar temperature to that advised for the preceding. Towards the beginning of March shorten the shoots back to about half their length, they will then be in a fit condition for potting about the middle of April. It is not advisable to shift them so early as some things, as their roots do not get into an active state so soon as those of many plants of a similar character. If, when turned out of their pots, they are found to have plenty of roots, they will bear a 3-inch shift. Good fibrous peat, not broken too fine, with a moderate quantity of sand added, is the most suitable material to grow them in; in potting ram the new soil well down. Place the plants where they can be a little close for two or three weeks, and keep the material on which they stand damp by syringing in the evenings, and also syringe them overhead. Shade slightly in bright weather, and discontinue it as the sun declines in the afternoons, otherwise the growth will be soft and liable to the attacks of mildew. Train the strongest shoots out horizontally, bringing them well down to the rims of the pots. When the roots have got hold of the new soil give air freely, so as to induce stout growth. They are free rooters, yet we should not advise giving a second shift during the summer, as they winter better when the pots are filled with roots.

If the plants have made their wonted progress by the end of June the young shoots will have extended considerably, and should have their points nipped out, which will induce them to break back. This stopping must not be delayed until later in the season, or it necessitates more of the growth being removed, which is so much loss, and does not allow time for that which is made afterwards to get fully matured. Continue to keep the centre of the plants well open by training the shoots out, as advised after potting; if this is not attended to, their dense habit does not admit of enough light and air getting through them. About the end of August discontinue the use of both shade and the syringe, giving plenty of air day and night. This and the drier state of the atmosphere will discourage further growth, and allow of the ripening process being better completed before winter; during that season keep them as recommended for the preceding winters, where they will have all the light possible, but a night temperature of about 40° will answer now. Tie them out, using nicely made thin sticks; with weak-wooded things of this description nothing looks worse than thick clumsy sticks out of proportion to the plant they are intended to support. The natural free-flowering disposition will be seen by their showing bloom at the base of every leaf, for probably one-fourth the length of the preceding summer's shoots, from the points downwards. But it is not advisable to allow them to flower this year, as it would considerably interfere with their growth. About the same time as advised the preceding season cut the shoots back just at the point below where the flowers are showing; they will then break into fresh growth, and must be potted in April. This time they will bear a 4-inch shift, using the soil in a more lumpy state; treat as before in respect to air-giving, moisture, and shading, and about the same time as last year pinch out the points of the shoots, still keeping the centre of the plants well open. As autumn approaches again give more air, dispense with the use of the syringe, and allow them the benefit of the full sun. By this time, if all has gone well, they will be good bushy plants, and should be neatly trained, not using more sticks than needed for their support. The following spring they will flower freely, and can, if required, be used for conservatory decoration. As soon as they have bloomed cut them back just below the point where they have flowered, and when they have broken into growth move them into pots 3 or 4 inches larger: treat in every way as advised for the preceding seasons, except that this summer they should not have their shoots stopped, but be allowed to grow on until the approach of autumn. By this means they will have more length, and produce a correspondingly greater quantity of flowers the ensuing spring, by which time they will have grown into nice young specimens fit for exhibition if required. If intended for this purpose they must be kept cool all through the autumn and winter, having only enough warmth to prevent them from being frozen; if not so treated they will come into flower earlier than wanted. After blooming shorten back the shoots as in the preceding spring. They will not require potting this season, nor most likely for a couple of years, during which treat generally as heretofore. When again moved, a 3-inch shift should keep them going for several years, during which they will be benefited by an application of clear manure-water once a week in the growing season.

T. ericæfolia. Is dense in habit, making a quantity of slender shoots, which grow to a considerable length in the course of a season. Although under cultivation not usually so long-lived as some plants, it will often last for a number of years in a healthy condition until it gets as much as 5 feet in diameter. There is, as has already been alluded to, another form of the plant with hirsute foliage, differing little in other respects. From New Holland.

T. verticillata. This plant is different in habit and appearance from the above. It is of remarkably elegant, slender growth, the flowers, violet and red, are produced from the young growth freely and almost continuously during the spring and summer months; and combine well with its linear leaves, borne in whorls; even when out of flower it has a very nice fresh look. It is a much smaller grower, requiring proportionately less root-room than T. ericæfolia. Swan River.

Insects.—T. ericæfolia sometimes suffers from mildew; as soon as this parasite is discovered the affected plants must be dusted with sulphur, which should be allowed to remain on for a few days and then be washed off with the syringe. Red spider sometimes makes its appearance upon them. When this pest is found it should be exterminated at once by a thorough syringing with weak insecticide, laying the plants down so as to wet every part.

THAMNOPTERIS.

A small genus of handsome greenhouse Ferns, some of which have a noble appearance. T. Nidus, the Bird's Nest Fern, is one of the best and most distinct Ferns in cultivation.

For propagation and cultivation, see Ferns, general details of culture.

T. australasica. New South Wales.
T. Nidus. East Indies.

THEA.

(The Tea Plant.)

The so-called different kinds of the Tea plant, if different they really are, are related to the genus Camellia, and are much inferior so far as appearance goes to the many fine sorts of that magnificent flowering shrub; yet these, with other plants of commerce, are prized by some for the associations connected with them.

They require the same treatment as Camellias, which see.

The following represent the different varieties:—

T. assamica. Flowers white. Assam.
T. Bohea. White. China.
T. viridis. White. China.

THEOPHRASTA IMPERIALIS.

There are one or two other species of Theophrasta known in cultivation, but they are so far inferior to this that we have deemed it not necessary to further allude to them. T. imperialis is an evergreen stove plant from Brazil. To grow so as to fully develop its leaves, it should have a strong heat through the growing season; it grows freely when once rooted, but is one of the most difficult plants in cultivation to strike from shoot cuttings. We have seen cuttings made from young shoots, taken off with a heel, stand in a strong heat fresh and green in appearance for two years without emitting a root, although they have callused over at the base completely, and some ultimately form roots. It strikes readily from root cuttings, where these are procurable, treated in the ordinary way, or it may be propagated from seeds, but as it rarely, if ever, produces these under cultivation, it is better for the generality of those who purpose growing it to procure young plants from those who grow such for sale; they can be bought in 6-inch or 8-inch pots. If got in the spring they should, about the beginning of April, have a shift into pots 4 inches larger; turfy loam is the best soil for them; afterwards place in a temperature of 65° or 70° in the night, with proportionately more warmth in the day. The leaves are very hard in texture, and not likely to suffer from a moderate amount of sun reaching them unless they are so exposed as to get scorched, yet it is best to shade when the weather is bright, for if the leaves are once injured, there is no way of rectifying the mischief except heading down and bringing up another growth, which takes a considerable time to accomplish. Keep the atmosphere fairly moist with air when favourable and syringe daily. The plant is a free-rooter, and by the beginning of August pots 3 inches larger will most likely be required, after which continue to treat as before until the days get cool; then reduce the heat to 60° or 65° in the winter during the night.

By the spring, if all has gone well, the plants will have attained a handsome size, and will want pots 16 inches or 18 inches in diameter, which are as large as will ever be required; increase the warmth as in the year before, and treat as advised for the preceding summer. As increased strength is acquired, the large spiny-edged leaves will be produced in considerable numbers at a time. The height the plants are allowed to grow will be regulated by the height of the house in which they are to stand and the condition the lower leaves keep in, as, in common with all things of single stem (which is the form to which this Theophrasta requires to be confined) it should never be allowed to go on after the bottom leaves begin to get shabby; when this occurs the plants should be headed down in the spring or early enough in the summer, so that the young shoots to be grown up from the old stool may have time to make some progress before the season of lower temperature has arrived. When cut down keep the stools in a brisk heat, where they will soon break out several shoots; choose the best placed of these, removing the remainder, and after 10 inches or 12 inches of growth has been made shake away three-fourths of the old material, placing the plants in fresh soil in pots about half the size of those they have occupied before. Manage as previously in every way, giving additional pot-room as required; they will make handsome specimens after being thus treated, with big leaves drooping down, so as completely to cover the pots. This Theophrasta grows well with the help of manure-water, by which means somewhat smaller pots will suffice, but still it can never be grown to a handsome size without more root-room than is required by many things.

Insects.—Its leaves are so hard in texture, that, when the syringe is used, few insects can effect a lodgment except scale, which can be removed with a soft brush or sponge.

THIBAUDIA.

A genus of pretty evergreen shrubs, the most desirable kinds of which may be grown under greenhouse treatment, but are better for a little more warmth in the winter than the generality of plants cultivated in such structures usually receive.

They can be propagated by shoot cuttings struck in an ordinary way, and grown on under conditions such as answer for other warm greenhouse subjects. Peat soil, to which a moderate amount of sand is added, is best for them. They should have plenty of light all through the growing season to thoroughly ripen their wood, upon which depends the production of the full quantity of bloom. The flowers of all the undermentioned kinds are tubular in shape, and when the plants are well managed they are produced in such quantities as to render them effective.

T. acuminata. A free-blooming species that keeps on producing its red flowers for a considerable time during the spring months. It comes from Ecuador.

T. Jussieuei. A large-leaved species, the flowers, red in colour, are borne in bunches in spring. From the Caraccas.

T. macrantha. A handsome species, bearing in spring quantities of pretty red and white flowers. Introduced from Moulmein.

INSECTS.—Red spider is often troublesome on these plants in summer if due attention is not given them by a regular use of the syringe. Aphides sometimes affect the young shoots, and can best be got rid of by fumigation.

THRINAX.

In this genus we find some of the handsomest of stove Palms known to cultivators; they attain a medium size, but are several years before getting too large to be accommodated in a house of ordinary dimensions. They will thrive in an intermediate temperature.

The method of propagation and after management will be found under Palms, general details of culture.

T. barbadensis. A handsome, free-growing stove species that attains a moderate size; the leaves are fan-shaped, and divided on the margin. Very pretty in a small state. It comes from Barbadoes.

T. multiflora. A beautiful stove species that requires a good deal of room, as it acquires age the leaves extend so as to cover a considerable space; they are fan-shaped, deeply divided at the margin; the under surface is white. From Central America.

T. parviflora. This is a smaller grower than the preceding kind; the stem, leaf-stalk, and leaf-blade all being much smaller, the margin of the leaves is deeply divided. It is a very effective plant. From the West Indies.

T. radiata (syn.: T. elegans). This also is a stove species, and one of the handsomest of the genus. It attains a medium size, the leaves are palmate, shining green in colour, and deeply divided at the margin. From the West Indies.

THUNBERGIA.

There are several stove species of this family well deserving of more general cultivation than they receive. They are evergreen climbers of vigorous habit, and particularly suited to a large house where their free, vigorous growth has scope for extension, as it is under such conditions that their pendent branches and handsome flowers are seen to advantage. In small structures where there arises the necessity for a continuous use of the knife to keep them within bounds, they have little chance of displaying their natural habit of flowering, and it is on this account most likely that the plants get an indifferent reputation, and are comparatively seldom met with. Most of the species worth growing can be raised from seeds, but as these plants, in common with many things of a vigorous habit, do not often produce seed under cultivation, it is necessary to obtain imported seeds when they are raised in this way, and, as they propagate readily from cuttings, it is well to confine the details of their increase to this method. After the plants have been cut in during winter and have again broken into growth, when the shoots have reached a length of 4 inches take them off with a heel and insert them singly in small pots, drained, and half filled with sandy soil, the remainder all sand; keep them moist and close under a propagating glass in a temperature of 70°. They will root in a few weeks; then remove the glass, and as soon as the little pots contain a fair amount of roots shift to others 6 inches or 7 inches in diameter. It is not of much consequence whether peat or loam is used to grow them in, as from their free habit they will succeed in either; although, as we have before said in speaking of vigorous-habited stove subjects, they generally bloom freer in good loam than in peat. Use the soil in a rougher condition than is necessary for weaker-rooted things. The plants, being climbers, will, as they get fairly into growth, need a stick each for support;

keep them in a brisk stove temperature where they can receive a pretty full amount of light and air during the middle of the day and no more shade than is requisite to keep the leaves from scorching. Syringe freely in the afternoons at the time the house is closed, and pinch out the points of the shoots when they have attained the length of 3 feet to cause them to break out several branches.

All the kinds are comparatively quick growers and the plants will bear moving into 10-inch or 11-inch pots by the end of June ; treat them in other matters as before, and train the shoots on the rafters, or whatever position they are intended to occupy ; possibly some flowers may be produced towards the end of summer, but it is in the following season that the display may be looked for. By the middle of September cease syringing and shading, give more air and less water to the roots, so as to discourage growth and gradually bring them to a state of rest ; a night temperature of 60° through the winter will answer. About the commencement of the year cut out the weak shoots should any exist, and later on, when growth has begun, move the plants into 16-inch or 18-inch pots, or even larger, if a large space has to be covered with their branches. As the summer advances treat as advised the preceding season and keep the shoots loosely trained to the position they are intended to occupy, allowing their lateral branches to hang, in which way the flowers are seen to so much better advantage than when tied in too closely. As the pots get full of roots give manure-water freely. Instead of confining their roots to pots they may be planted out, but even where a large space is available for head-room it is not advisable to have the bed in which they are turned out too large, or they get almost unmanageable. When the flowering is over cut back the shoots so far as necessary, and in the spring, when growth is about beginning, turn those that are in pots out, removing some of the soil about the upper portion of the ball, and replacing it with new ; as soon as the roots have fairly begun to move manure-water must be freely used, without which, unless much larger pots or tubs are employed than are necessary for most things, they will not, on account of their vigorous habit, have enough sustenance to keep them going so as to make the requisite growth. Where planted out remove a portion of the surface soil in spring and replace it with new. Most of these Thunbergias will last longer where they have a bed of soil wherein to extend moderately, as their rapid formation of roots, even with a liberal application of manure-water, quickly exhausts the limited quantity of soil a pot holds ; consequently, when confined to pots it is necessary to propagate sufficiently often to keep up a supply of plants to take the place of those it becomes necessary to discard.

The undermentioned kinds are the most desirable :—

T. alata. Has yellow flowers, produced in summer or autumn. A native of India.

T. chrysops. A native of Sierra Leone, has flowers of a blue or violet shade, produced in summer or autumn.

T. coccinea. From Trinidad, bears scarlet blooms, which, like those already named, appear in summer.

T. fragrans. Is a white-bloomed species, and, as its name implies, fragrant. It comes from India, and flowers in the summer.

T. Harrisi. A pale blue kind, which has a yellow eye that sets off the flower very well ; it comes from Madras ; a summer flowerer.

T. laurifolia. A pale blue-flowered species from Malacca, with handsome foliage and a strong, rambling habit of growth ; blooms in summer.

The whole of these are really stove species, and it is no use attempting their cultivation unless a suitable temperature is at command.

INSECTS.—Those that attack most heat-requiring plants will live upon Thunbergias, and must be dealt with when they make their appearance in the usual way by washing, sponging, and syringing.

THYRSACANTHUS RUTILANS.

This plant belongs to a limited section of Acanthads, and is much the best of the Thyrsacanthus. It is not only deserving of cultivation on account of its elegant habit, but its merits are still further enhanced by the singular, long, drooping panicles of red tube-shaped flowers which appear in the winter season, when bright flowers are doubly acceptable. The Thyrsacanthus are nearly allied to Justicias, and, like some of them, this plant possesses an upright habit of growth. It is a native of South America, from whence it was introduced about thirty years ago. It is easily grown, but requires a moderate stove or intermediate temperature. Cuttings made of the young shoots, which are produced early in the spring after the plants have done flowering, if taken off when about 3 or 4 inches long, will root readily inserted in small pots filled with sandy soil, kept moist, shaded, and covered with propagating glasses in a temperature of 68°

or 70°. When well rooted remove the glasses, and let them have a fortnight to get hardened a little before moving into 4 or 5 inch pots; pinch off the points at the same time, keep them in a temperature similar to that in which they have been struck, and allow the heat to rise in the daytime correspondingly with the weather. They need to be well supplied with moisture at the roots as well as in the atmosphere; syringe them overhead in the afternoon; a little shade may be required when the weather is sunny.

We have already intimated that the plant has a persistent erect habit of growth, and it is not well to attempt to alter this by training further than stopping the young shoots to cause them to break out several branches; to effect this a second stopping will be required in June, after which it may be necessary to put a single stick to each for support; this will generally be found sufficient, as their erect cylindrical form, when preserved, fits them for associating with other subjects of a more bushy shape. By the end of June they will need moving into the pots in which from this time they are to be grown and flowered; these may be from 8 to 12 inches in diameter, according to the strength of the plants and the size they are required to attain. After they have had a week or two to get established they will do better in a low, light pit where they can be stood with their heads close to the glass, admitting a moderate amount of air in the daytime, and encouraging growth by closing early; give as much shade as will keep the leaves from being injured when the sun is powerful, but not more, otherwise the plants will become drawn and be deficient in the solidity of growth which is so necessary to ensure the full complement of bloom.

Towards the end of August give more air and less shade, and do not syringe overhead so often. From the time the pots are fairly filled with roots manure-water, not too strong, will be an assistance. The temperature through the summer may be such as ordinary soft quick-growing subjects of a like character require, and should be regulated according to the weather, from 60° to 65° in the night, and proportionately more in the day; reduce the warmth given as the autumn comes on, but they must not even then be kept too cool, or their roots, as well as the heads of the plants, will get checked in a way that will interfere with their blooming; 60° by night with 6° or 8° higher in the day will suit them through the later months of the year when they will be in flower. After the blooming is over as many of the plants may be saved as are required to produce enough cuttings for another year, and the remainder may be thrown away, as young examples will usually be more useful. The old plants for stock should be kept during the winter at about 60° in the night, and the soil should be slightly moist, but not so as to encourage much growth until towards spring.

Insects.—Aphides and red spider sometimes attack this Thyrsacanthus; to keep them down syringe and fumigate. If any of the worse description of insects make their appearance they must be removed by sponging, as soft-leaved plants of this description have not enough substance in their foliage generally to bear dressing with insecticide strong enough to kill the insects.

TILLANDSIA.

These Bromeliaceous stove plants are mostly epiphytal in habit. Some of them have exceedingly handsome flowers, as in the case of the charming T. Lindenii the exquisite blue colour of which is equalled by very few tender subjects, while others possess little beauty in their flowers, but have handsomely marked leaves, like T. zebrina. They are all of dwarf habit, having more or less of the peculiar vase-like arrangement of the leaves present in the Bromeliaceous plants generally. They are handsome subjects for the decoration of warm plant structures, such as Orchid houses, where their form of growth and their appearance contrast with the uniformity of the principal occupants. But coming, as most of them do, from parts of the world where there is always, or nearly always, present a considerable amount of atmospheric moisture, with a good deal of warmth, they will not bear being kept in a cool, dry place; nor should they be allowed to get dry at the roots. They are increased by seeds and suckers, the latter is the method that will most commend itself to the generality of growers.

Plants of these Tillandsias that have flowered usually afterwards throw up from the base suckers more or less in number. These should be allowed to acquire strength before they are taken off. If severed from the parent plant while very small much time will be lost, as they will thrive a deal faster attached to the plant on which they have been formed than when separated, if the separation is affected before they have gained enough strength. It is necessary that the material in which they are to be grown should be of a loose, open description, such as the roots in their native habitats revel in—fibrous matter like that furnished by good Orchid peat, mixed with sphagnum, broken potsherds, or charcoal, to which has been added a little sand. Suckers in the state described should be taken off in spring, or sufficiently early in summer to admit of their getting established before autumn. Strip off a few of the small leaves at the base, and put them in as Pine suckers are treated, in open material such as described; keep them moderately moist and shaded, in a temperature of 70°. They will soon root, but they must not be confined in the manner that ordinary cuttings are struck under propagating glasses, or they will most likely rot. Pots that will just hold the suckers will be large enough for a time until they have made a good quantity of roots. Less pot-room suffices for these Tillandsias than for most things, but when the pots get full of roots move them into others larger, proportionate to the strength of the plants and the size that the particular species attains, using rough fibrous soil like that already named. Little further is required than a routine course of treatment; keep them quite moist at the roots in the growing season, and never dry, even in winter, and give such shade and air as required for most stove plants.

The spring and summer temperature should be from 60° to 65° at night, with 10° or 15° higher by day, and air in the daytime. In the winter, when at rest, a night temperature of 60° will suffice, giving a few degrees more warmth by day. The plants last for many years provided they are fairly treated, not being liable to die off as some things do. There is great difference in the size the various species attain, consequently the root-space, when the plants are fully grown, must be regulated in accordance with the requirements of each particular kind, but as they increase by the production of suckers it is better with most of the species to separate them, as they look best when confined to single crowns.

The undermentioned are all very handsome:—

T. (*argentea*) *Gardnerii.* A pretty species; leaves densely silvered; flowers small and much crowded; colour purple. Trinidad.

T. Balbisiana. A medium-growing species with green leaves, coated with whitish powder. Flowers violet purple; bracts dark rose. West Indies.

T. Lindenii. This is a charming plant of small growth, with olive-green, recurved leaves, producing beautiful blue flowers issuing from an erect scape with bright rosy bracts; the combination of colours has a charming effect. It is a native of Ecuador.

T. musaica. The leaves of this plant are a foot long, they are banded across with broad, irregular bars of dark green and greyish yellow alternating. It comes from the United States of Colombia, and is a very handsome plant.

T. Roezlii. A strong-growing kind, leaves green, with dark markings; flowers rose colour. Peru.

T. splendens. A handsome compact growing species that has green leaves deeply banded with blackish brown. The flowers, which are white, are produced from a stout erect flattened stem, clothed with pinkish red bracts.

T. tessellata. Another very fine species with bold leaves, glaucous green mottled with yellowish green on the upper surface, and veined with rose-purple on the under side.

T. (*Wallisii*) *circinalis.* Leaves heavily covered with the silvery powder-like coating peculiar to Tillandsias. Flowers violet. Uruguay.

T. zebrina. A low-spreading species, the leaves of which cling to the surface, and are banded across with brown, ground colour green. A native of South America.

There are several other species in cultivation, but those described are the most distinct and handsome; all the others will succeed under the treatment detailed.

INSECTS.—The hard nature of the leaves render these plants little liable to the attacks of insects. Scale, both the brown and the white species, will live upon them, but is easily removed by sponging.

TODEA.

A genus of filmy Ferns, several of which stand at the head of this curious section. They do not like much warmth, a greenhouse temperature is quite enough for them. They make beautiful room plants confined in a case large enough to admit of the fronds attaining their full size.

For propagation and cultivation, see Ferns, general details of culture.

T. Fraserii. New Holland.
T. hymenophylloides. New Zealand.
T. intermedia. New Zealand.
T. superba. New Zealand.
T. Wilkesiana. Fiji Islands.

TORENIA.

These are softwooded stove plants, procumbent in habit, and attain a medium size. They are free and long continuous flowerers, and are easily grown and propagated. The species mentioned below are especially adapted for baskets suspended from the rafters of the house in which they are grown. In this way not only are they seen to the best advantage, but they also contribute materially to the general effect of the assemblage of plants with which they are associated. One gain attached to the cultivation of these and other plants of a similar nature is that they occupy so little time in arriving at a blooming state after being started. Most of the Torenias are annuals, and can be raised from seeds sown in the spring and treated to a moderate stove heat, but the most convenient method of propagation, when once in possession of the plants, will usually be from cuttings. They may be struck at any season of the year when young soft shoots can be had that have not a disposition to bloom, such as are generally to be found springing from the base of the plants. If these are taken off in August or September and put in small pots half filled with a mixture of loam, leaf-mould, and sand (the upper part all sand), kept moist, shaded, and covered with a propagating glass in a temperature of 68° or 70°, they will soon strike; when well rooted they should be moved into pots a size larger, in soil composed of loam with a little leaf-mould and sand added, and the points of the shoots should be pinched. They should be kept on a shelf near the roof so as to be under the full influence of the light. As winter advances keep them in a reduced temperature of 60° by night, and a little more in the day, proportionate to the state of the weather. Towards the end of February give some more heat, and as soon as they begin to grow freely move them into 6-inch pots, using similar soil to that advised for the autumn shift; pinch out the points of the shoots again, still keeping them close to the glass. They will need a small stick or two for support. Give more warmth as the days get longer, and by the end of April they will require moving into the pots they are to bloom in; 9 or 10 inch ones will be quite large enough. When in these the plants will be better hung up in a position similar to that which they are to occupy when in bloom. Should they not seem likely to form shoots enough to make them fully furnished, stop the points once more; put two or three small sticks so as to hold a few of the growths in an erect position, and let the others hang down. An ordinary stove temperature will suffice, giving a little shade in the middle of the day, with air according to the weather, and syringing overhead in the afternoons; they will soon come into flower, and will want nothing more to keep them in condition for many weeks than a supply of weak manure-water. Before the plants get too much enfeebled with flowering, towards the close of the summer again strike cuttings, treat them as just recommended, and discard the old stock.

The stove species that are best worthy of cultivation are:—

T. asiatica. Flowers purple; from China.

T. Baillonii. A distinct-looking plant with yellow flowers, having a purple throat; China.

T. Fournierii. A compact-habited species with porcelain blue flowers and yellow eye.

INSECTS.—Greenfly is their worst enemy, and, should it appear, fumigation with tobacco is the best remedy. The daily use of the syringe, necessary during spring and summer, will generally be found sufficient to keep down red spider, which also sometimes attacks them.

TOXICOPHLÆA THUNBERGII.

In this we have a very distinct and desirable stove plant. Its habit is bushy, the branches partially erect, but not very stout, leaves pale green, tough and leathery. It is a remarkably free bloomer; the flowers are tube-shaped, five-lobed, and in general aspect individually not unlike those of a medium-sized Bouvardia. They are white, deliciously fragrant, and produced in corymbs at the extremities of the shoots and also at the axils of the leaves so freely as to form sprays of inflorescence. It comes from South Africa, and thrives freely under ordinary stove treatment. It is propagated from cuttings of the young shoots taken off in spring, when these can be had in a sufficiently firm condition; inserted singly in small pots in sand, kept warm, shaded, moist, and confined under a propagating glass, they will form roots in the course of a few weeks, after which dispense with the glass, and when growth has fairly begun move them singly into 3-inch pots, using good peat and a little sand; pinch out the points of the shoots to induce the formation of additional branches. It is necessary with this Toxicophlæa to be more attentive in this matter of stopping than with some other things, as it has a disposition to grow up somewhat spare and thin, to correct which timely stopping is needful. If the plants do not get sufficiently clothed in their early stages the defect cannot afterwards be corrected except by heading down. Let the young plants have plenty of light, but a thin shade will benefit them when the sun is powerful. During summer they will bear as much heat as is required for the generality of stove plants, and as the pots get filled with roots move into others 3 inches or 4 inches larger, after which nothing further is required but to pinch out the points of any shoots that are taking an undue lead. Cease shading in September, and as the autumn draws on reduce the temperature; through the shortest days a heat of 60° in the night will suffice.

This Toxicophlæa will flower when very small, but with plants of this description it is for a time best to look more to getting them larger than to blooming. With this view cut out the points of all the strongest shoots about the end of February, and in the ensuing month move them into pots 3 inches or 4 inches larger, increasing the temperature gradually, and treating in other respects as through the summer previous, using the syringe daily. If the plants have made good progress by July, they will require a little more root-room, but as they never attain the size that some of the stove occupants do, it is well not to give more root-space than is necessary. Twelve-inch or 13-inch pots should be large enough to suffice, and the peat must now be a little more lumpy than in the first stages of growth. At all times mix enough sand with the peat to keep it open; this is the more necessary with plants of this character that do not require or bear to be shaken out and have the soil renewed in the way usual with coarser-growing subjects. Treat as before through the autumn and winter, and in the spring increase the heat with the advent of more sun. If all has gone well they will bloom profusely, during which time, if they can be kept in a little drier atmosphere than heretofore, their flowers will last longer. They are useful for cutting. After the blooming is over, cut the shoots back a little, and when they have started into growth they may be shifted into pots an inch or two larger. The subsequent management required will be of a routine character similar to that advised hitherto. If in the growing season a liberal application of weak manure-water is given once or twice a week, healthy growth will be secured without having recourse to large pots. The plants will last for several years, and if the soil gets exhausted, the balls can be partially reduced and new material given in place of the old; this should be done when they have just broken into growth after being cut in when the flowering is over, keeping them close and warm for a few weeks until they again get established.

INSECTS.—The worst species of insects will live on this plant, but the stout nature of the leaves makes their destruction by the aid of insecticide comparatively easy; dipping or syringing is the best remedy as often as they are found to be affected.

TRACHELOSPERMUM JASMINOIDES.

(Syn: Rhynchospermum.)

In this we have an evergreen greenhouse climbing plant of moderate growth, alike suitable for a trained pot specimen or for growing on a pillar or rafter, where the space to be covered is not too large: for although, in common with almost all other plants indigenous to China, it is a free grower, it does not attain the size of many climbers. From the locality in which it is found, Shanghai, it is very nearly hardy in this country, succeeding on a sheltered wall, with a little protection, in the south of the kingdom; yet it is a plant that will thrive under a very considerable range of temperature, and will do equally as well in a cool stove, or intermediate heat, as it will in a greenhouse; but of course the progress made, especially during the early stages, is much quicker when it is subject to heat. It will bear forcing; its white, fragrant Jasmine-like flowers are produced freely. The shoots are of a semi-twining habit, and when the plant is in vigorous health will extend to considerable length in a single season, particularly if submitted to a warm, humid atmosphere. The perfume is very agreeable and powerful; a small plant in flower will load the atmosphere of a large house. The ease with which it may be grown, even by those who have not had much practice in plant-growing, commends it to the inexperienced. When in a strong vigorous state each bunch contains a number of flowers, which open in succession, keeping the plant gay for several weeks consecutively.

It is well adapted for conservatory decoration, as the hard texture of the leaves renders it little subject to injury by being kept, while in flower, somewhat crowded among other things in a way that is often unavoidable in such structures. The somewhat short foot-stalk renders the flowers less serviceable for using in a cut state than they would be if it were longer; nevertheless, if not subjected to too much heat in opening, they are useful for bouquets. The plant strikes readily from cuttings made of the young shoots taken off when in a half-ripened condition, such as obtainable about July, using good stout pieces of the extremities 5 or 6 inches in length; if these are put singly in 3-inch pots drained and three-parts filled with fine peat and sand, the remainder all sand, kept moist, shaded, and close in a propagating frame or under a bell-glass, in moderate stove heat, they will soon make roots. Then give more air, keep them through the autumn and winter in an intermediate temperature, and supply enough water to the soil to keep the roots slowly moving. In March give 6 or 7 inch pots, using soil similar to that in which they were struck, and pinch out the points of the shoots. Through the spring and summer keep them in a growing atmosphere with a moderate amount of air, and a little shade when sunny; syringe overhead at closing time. Two or three sticks will be required round which to train the shoots as they extend; beyond this nothing will be needed but the same treatment through the autumn and winter that they received in the last. Pot about the end of March, giving them a 2 or 3 inch shift according to the strength and quantity of their roots. The plant will succeed in either peat or loam, but we prefer the former, as it will induce quicker growth, and in it the leaves have a darker, more healthy tint, which adds much to the general appearance, especially when in bloom, the dark glossy green Myrtle-like foliage forming a good background for the flowers. Let the soil be of a good fibrous description, and from the first be used in a moderately lumpy state, as the roots are naturally strong. Add enough sand to keep it open, and drain the pots sufficiently. When the potting is completed put half-a-dozen sticks 3 feet long in the new soil just inside the rims of the pots. Round these train the shoots, at the same time pinching out the points to cause the production of an increased number of growths, for although really a climbing plant, and as such not necessarily requiring so much stopping as if it possessed a shrubby habit, enough shoots should be formed to furnish the trellis which the plants will ultimately require. Place them in a house or pit, if such is available, where there is a night temperature of 50°, with a rise of 10° in the daytime. This will answer well for them, and so treated they will make much greater progress than if grown cooler; do not give much water at first until the roots have got possession of the new soil. Syringe the plants overhead every afternoon, and close the house at the same time; as solar heat increases the temperature they are subjected to may be proportionately raised. Very little shade will be required except for a few hours in the middle of the day in very bright weather; give plenty of light, or the growth will become too much elongated and weak. The shoots as they grow must be kept regularly trained round the sticks—never bring the points too low down, but allow them to retain an upright position; a continuance of this treatment will be all that is needed through the summer, enough air being admitted in the middle of the day. By the middle of September discontinue syringing, and give more air with a drier atmosphere to discourage further progress and ripen up the growth.

Through the winter the plants will do in any house or pit where the temperature is kept at 35° in the night, giving just as much water to the soil as will keep the roots slightly moist. Again, in the spring, about the same time, remove into pots 4 or 5 inches larger, using similar soil. Uncoil the shoots from the sticks, replace these with others longer and thicker that will support the increasing weight of the shoots, and train regularly as before. It is not advisable to use a wire trellis until the season following; if the shoots are not sufficiently numerous, or there is an appearance of their extending too far, so as to be deficient near the base, again shorten the leaders. Treat through the spring and summer as in the preceding season, as before giving less water and more air in the autumn. We have said nothing about flowering during this summer, although the plant is such a free bloomer that it will have produced its bunches at almost every joint; but as the object will be to induce as much growth through the season as possible, the treatment when in flower should have been such as to keep them on growing.

Keep through the winter in a temperature such as in the last, and repot again in the spring, giving a shift of 3 or 4 inches, in proportion to the quantity of roots the plants have got. As before, take them off the sticks round which the shoots have been trained; they will now be large enough to cover a moderate-sized wire trellis, some 2 feet in diameter by 2½ feet high above the pot; over this train the shoots regularly from the base to the top, and place them in a temperature similar to that to which they have each preceding spring been submitted if they are required early in bloom—if not they may be kept 5° cooler. When the flowers are about to commence expanding they can be moved to a conservatory, or any house where they will not be kept at much above an ordinary

Trachelospermum (Rhyncospermum) Jasminoides.

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greenhouse temperature, and will receive a little shade from the sun, which will prolong their flowering. Afterwards, if they are not required to be grown on larger without delay, they may be treated through the summer like the rest of the greenhouse hardwooded stock; if, on the other hand, it is deemed desirable to grow them on to a larger size without loss of time they should be submitted to a temperature such as hitherto used during the growing season. Be careful that the shoots as they extend do not get entwined round the wires of the trellis, or there will be some difficulty experienced in getting them loose to place upon a larger one, which they will require in the course of another year or two, when more root-room will be needed; thus treated the plants will last for many years.

When required for training up a pillar or rafter, it is well to grow them for a season or two in pots so that they may get strong before the roots are turned out in a border; this should be well drained and consist of good fibrous soil with enough sand and crocks, or charcoal, to keep it sweet and porous. Have the shoots from the first regularly trained, not allowing them to become entangled, and as the space they are to fill gets covered the superfluous growth may be shortened back immediately they have done flowering each season. When the soil gets exhausted some of the surface may be removed every spring and replaced by new, and when grown in this way, or in pots, manure-water will be a great assistance when the soil becomes filled with roots.

There is a variegated form of this plant that will succeed by being treated in the above manner. It is scarcely so desirable a variety as the green-leaved sort.

INSECTS.—The leaves, from their stout nature, do not suit the tastes of red spider or aphides; these insects, however, will live upon the plant, but can be easily kept down by syringing. For thrips, which are sometimes troublesome, fumigate, or syringe with tobacco-water. If scale makes its appearance it must be carefully removed by the use of sponge and brush. For mealy bug, syringe and dip with a strong solution of insecticide in the winter when at rest.

TRADESCANTIA.

The creeping species of Tradescantia are very useful for draping hanging baskets containing other plants, as, if required, their pendent shoots can be made to cover the whole outside of the baskets. They are also particularly adapted for growing as an edging to plant stages, or trailing over rock-work in the stove.

Their cultivation is as easy as possible, as the shoots root like weeds at any time of the year in a moderate heat, kept a little but not too close, with shade from the sun. When rooted they may be put singly in small pots, and as soon as fairly established planted where they are to remain.

The following are adapted for growing in the way described:—

T. discolor. A pretty kind, from South America.

T. discolor variegata. Has neat variegated foliage. A native of Mexico.

INSECTS.—Few insects molest Tradescantias if the precaution is taken to use the syringe daily in the growing season. Should aphides affect the points of the young shoots, fumigate.

TRICHINIUM.

Low-growing annuals with somewhat singular flowers, but not possessing very much merit.

They can be raised from seeds sown in spring in a pit or greenhouse in the usual way, with additional pot-room as required. The best are:—

T. alopecuroideum. Flowers red and yellow, produced in summer. A native of Australia.

T. Manglesii. Flowers white and pink, forthcoming in summer. From Australia.

TRICHOMANES.

A genus of beautiful little filmy Ferns, many of them requiring similar treatment to the Hymenophyllums and Todeas, others doing better with a little more warmth.

For propagation and cultivation, see Ferns, general details of culture.

STOVE SPECIES.

T. anceps. West Indian Islands.
T. alatum. West Indies.
T. auriculatum. Java.
T. Bauerianum.
T. brachypus.
T. crispum. West Indies.
T. Filicula. East Indies.
T. fimbriatum. West Indies.
T. longisetum.
T. Luschnathianum. Brazil.
T. membranaceum. West Indies.
T. muscoides. West Indies.
T. Sellowianum.
T. spicatum. Jamaica.
T. Zollingerii.

GREENHOUSE SPECIES.

T. angustatum. West Indies.
T. humile. Isle of Luzon.
T. pyxidiferum.
T. radicans. West Indies.
T. radicans Andrewsii.
T. radicans concinnum.
T. radicans dilatatum.
T. reniforme. New Zealand.
T. trichoideum. West Indies.
T. venosum. New Zealand.

TROPÆOLUM.

These are handsome plants; most of the greenhouse kinds are of twining habit and may be grown as climbers, planted out or in pots, or they can be kept in pots and trained to supports in the form of a bush, or otherwise, at the discretion of the cultivator.

They may be increased from seeds sown in an intermediate heat in shallow pans, in a mixture of sifted peat and sand; the seed can be put in at any time of the year, but we prefer the latter end of summer as soon as they are ripe; cover them slightly and keep the soil moderately moist. When the little plants are up stand them close to the glass, using a little shade so long as the sun is powerful, with air daily, and enough water to keep the roots in a healthy condition. Through the winter let them be in a temperature of about 45° or 50°; in the spring move singly into small pots, varying the size in proportion to the strength of the kinds grown; use soil similar to that in which the seed was sown, but with less sand in it. Keep now, and through the summer, in a warm greenhouse temperature, with air and a little shade in sunny weather, supporting the shoots with sticks so far as needful, and keeping the soil moderately moist. Give larger pots to such as seem to require them further on in the summer. Admit more air in autumn, and keep through the following winter at about 45°. They will need more pot-room in spring, and in other matters should be treated as in the season before. The plants should bloom this summer, after which keep drier at the roots, especially in the case of the herbaceous sorts, while at rest. All that is required in subsequent years is to give larger pots to those that are grown in this way; the stronger-growing kinds can, if preferred, be planted out.

The following are all handsome flowered sorts:—

T. azureum. A Chilian species, with blue flowers, produced in autumn.

T. brachyceras. Flowers yellow; a summer bloomer. From Chili.

T. Jarrattii. Red and yellow; blooms in summer. From Santiago.

T. pentaphyllum. Flowers orange and yellow, produced in summer. A native of Monte Video.

T. polyphyllum. Orange and yellow; a summer flowerer. Chili.

T. speciosum. Has scarlet flowers, forthcoming in summer. From South America.

T. tricolorum. A slender-growing, beautiful kind that bears a profusion of orange and purple flowers in spring or summer. It comes from Valparaiso.

INSECTS.—Aphides and red spider will live on most of the kinds of Tropæolum; a free use of the syringe is the best mode of dealing with the spider; for aphides fumigate.

TUPIDANTHUS CALYPTRATUS.

This species often appears under the name of Aralia calyptratus, with which it is synonymous. In the early stages of its growth the plant has a somewhat bushy form, but as it gets older it assumes a climbing habit. For decorative purposes it is most useful while in a young state.

It can be increased by cuttings and grown on in the same way as advised for Aralia Sieboldii, which see. It does well in a greenhouse, and comes from the Khasya Mountains.

TYDÆA.

A genus of herbaceous stove Gesnerads, in appearance and general character much like Achimenes. Among the kinds in cultivation several are species, but more are hybrids. Although they may be had in flower at almost any time of the year, they are most useful in the autumn and winter.

Their cultivation in most respects is like that advised for Achimenes, which see, except that they must not be dried off as Achimenes require to be.

T. Ailsa. Vermilion, yellow and crimson.

T. Amazon. Vermilion, red, yellow, and crimson.

T. Bomb. Crimson and yellow.

T. Cecilia. Red, yellow, and crimson.

T. Chamalière. Red and yellow.

T. Elaine. Purple-rose, yellow, and crimson.

T. gigantea. Vermilion, and bright yellow.

T. Hypata. Rose, white, and crimson.

Vallota Purpurea

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T. Juliette. Rose-purple, white, and crimson.

T. Madame Halphen. Carmine, lilac, and rose.

T. Parepa. Rosy-purple, crimson, and blush.

T. Peronilla. Carmine, yellow, and maroon.

T. Sabina. Crimson, white, and rosy-purple.

T. Tricolor. White, pink, and amaranth.

T. Violet et Marron. Violet, white, and maroon.

URANIA SPECIOSA.

(Syn.: Ravenala madagascariensis.)

This is the only species belonging to the genus; it is a very large-leaved, evergreen stove plant, the leaves being similar in size and character to those of the largest Musas. It is only suitable for growing in a large house where there is enough room for its gigantic foliage to be seen fully developed.

It can be raised from seed sown in a stove temperature; subsequently the plants should be given liberal pot-room and good heavy loam, with some well-rotten manure and a liberal addition of sand to ensure enough porosity for the copious supply of water needful to meet its wants in the growing season; such shade as necessary to prevent the leaves being scorched in summer must be afforded. The atmosphere should be moderately humid during the season of growth, and air should be admitted regularly to impart the requisite solidity to the leaves, without which they are deficient in lasting power. It comes from Madagascar.

INSECTS.—A free use of the syringe through the growing season to keep down red spider and the other pests which affect stove subjects will usually be found sufficient to keep the plant clean.

URCEOLINA PENDULA.

A somewhat curious stove bulbous plant, not much grown. When met with it is often under the name of U. aurea, a distinctive name no doubt given to it on account of its colour, which is principally yellow. It thrives in either peat or loam, the latter when of good quality being preferable. It is increased from offsets, similarly to Eucharis, it requires plenty of water while growth is being made, during which time a moderate heat must be given; keep it cooler and drier when at rest. The usual time of blooming is in the summer, varied in accordance with the time growth is excited, and the amount of heat the plant is subjected to. The flowers are yellow and green. It comes from Peru.

INSECTS.—Most of the heat-loving insect pests will live on this plant; the leaves do not well bear the application of any insecticide strong enough to kill the worst species, such as scale, for which sponging is the safest remedy; for aphides or thrips fumigate.

UTRICULARIA.

The stove species of this singular genus are well worth a place in every collection of plants; their curious flowers have externally much the appearance of some Orchids. They make beautiful basket plants, their drooping flower-spikes are best seen when grown in this way, and when hung up the conditions best suited to their wants are present. They thrive well in a mixture such as most Orchids delight in; fibrous peat with sphagnum and a little sand is what they require.

They are increased by division of the crowns, which should be effected just before the plants begin to grow; afterwards grow them on hung up to the roof. Give air daily and shade from the sun, keep up a moderately moist atmosphere, and give a good supply of water through the season of growth; drier treatment is necessary when they are at rest.

The two following kinds are distinct and well worth growing:—

U. Endresii. A scarce plant, the flowers pale lilac. From Costa Rica.

U. montana. An older but much finer species than U. Endresii. It is a good grower and equally free bloomer; the flowers are white and yellow, produced in summer, in appearance not unlike, and almost equal to, those of a Phalænopsis. It comes from New Grenada.

INSECTS.—Thrips and aphides will both live on these plants, but must not be allowed to get ahead or they will do serious harm; the best remedy is to sponge with clean water or fumigate slightly.

VACCINIUM.

Most of the Vacciniums are hardy deciduous shrubs, but there are a few that require to be grown under glass.

The following are evergreen kinds that will thrive in a warm greenhouse, succeeding under treatment such as advised for Correas, which see.

V. coccineum. Flowers scarlet, blooms in summer.

V. Rollissonii. Flowers scarlet; a spring bloomer. From Java.

VALLOTA.

Evergreen greenhouse bulbs that produce freely large scarlet Amaryllis-like flowers. Vallotas are very nearly allied to Amaryllis, and are increased in the same way by offsets which are produced in large numbers: these require to be taken off the parent plants and treated as advised for the evergreen kinds of Amaryllis, except that they do not need anything above a greenhouse temperature at any time of the year. In winter the soil should be kept drier, but this must not be carried so far as to injure the leaves.

The undermentioned varieties differ only slightly:—

V. purpurea. Flowers scarlet, blooms towards the end of summer. A native of the Cape of Good Hope.

V. purpurea major. Scarlet, flowers a little earlier than V. purpurea. Cape of Good Hope.

V. purpurea minor. A smaller-flowered variety; scarlet. From the Cape of Good Hope.

INSECTS.—For aphides fumigate. Syringe through the summer at times to keep down red spider; scale should be removed by sponging.

VERONICA.

In these we have free-growing and equally free-flowering evergreen soft-wooded plants, with bright shining leaves and dense compact habit of growth. They are useful additions to our autumn-blooming plants suitable for greenhouse decoration.

They should be struck from cuttings, about February in warmth, similarly to Fuchsias, then moved singly into 3-inch pots, using ordinary loam well enriched; stop the shoots as soon as they begin to grow. After they are fully established keep in a greenhouse until the middle of May, when plant them out in moderately light soil in an open situation, giving water as required through the summer. About the middle of September take the plants up with no more root breakage than unavoidable and pot them; keep them in a close frame for a few weeks till the roots have begun to move freely, after which give air and water as needed, and treat like ordinary greenhouse stock.

The following desirable sorts are all garden hybrids:—

V. Andersonii. A free-blooming kind, with lavender, blue and white flowers.

V. Andersonii variegata. A prettily variegated form of the above.

V. Blue Gem. A dwarf-growing, pretty, blue-flowered variety; a profuse bloomer.

V. Brillantissima. A handsome sort, with crimson and white flowers.

V. Gloire de Lorraine Lavender and white.

V. Ne plus ultra. Dark blue and white

V. rosea elegans. Pink and white.

V. Socrates. Violet and ruby.

INSECTS.—We have not found these plants affected with any insects except aphides, for which fumigate.

VERSCHAFFELTIA

This genus of stove Palms is represented by two species, both of which are fine kinds, and require a strong heat to grow well.

For propagation and cultivation, see Palms, general details of culture.

V. melanochætes. A handsome and distinct-looking species; the stem is heavily armed with spines; the leaves, which attain a moderate size, are entire while the plant is in its first stages of growth, unevenly pinnate as it gets older From the Seychelles.

V. splendens. An exceedingly handsome species, with straight, slender, heavily-spined stem; somewhat short leaf-stalks supporting large plaited leaves, which are deeply divided at the extremity, and slightly so on the margin. From the Seychelles.

VICTORIA REGIA.

This, the Queen of Water Lilies, is unquestionably the finest of all aquatic plants. The gigantic proportions of its leaves, which even in a cultivated state attain a size of 6 or 8 feet in diameter, make a large house necessary for its culture; the tank in which it is planted should not be less than 24 feet across—if more all the better—and 4 feet deep. It must also be provided with a sufficient quantity of hot water piping to keep the water at a uniform temperature night and day, of from 80° to to 85°—this is indispensable as, like other water plants from hot countries, it will not succeed if the heat of the water fluctuates to any considerable extent.

In this country it is usually treated as an annual; the seeds should be sown about the beginning of the year. It is best to raise the plants in a tank, or other receptacle, much smaller than that which they are ultimately to occupy. The water must be kept regularly at the temperature above mentioned. put a few inches of soil

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A Water plant Garden

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V. Rollissonii. Flowers scarlet; a spring bloomer. From Java.

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A Water-plant Garden.

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at the bottom of the tank, on this place the seeds, and nothing more is required. They will soon vegetate, and when large enough to be conveniently handled the little plants should be put singly in shallow pots in which they are to be kept until the leaves are a foot in diameter, after which the strongest plant ought to be moved to the tank in which it is to flower. In the centre of this a mound of good ordinary loam must be placed 7 or 8 feet in diameter and about two and a half feet deep in the middle where the plant must be turned out; the water should have been introduced sufficiently long before this to admit of its becoming clear and getting warmed up to the point before mentioned. It is well not to have the water in the tank to the full depth at first when the plant is turned out of the pot, for as it grows it will rise above the soil, after which it becomes necessary to increase the water so as to keep the crown covered to the depth of about a foot. Provision should be made for a continuous regular supply of water to the tank; this is best effected by a pipe and tap introduced at one corner, the tap regulated so as to just keep the water trickling, with an overflow to allow of a corresponding outlet; by this means the water will be always clear, alike conducive to the well-being of the plant and agreeable to the sight. Nothing further will be required except regulating the ventilation so as to keep the temperature of the house right, in the night it should be from 66° to 70°, by day from 75° to 90° according to the state of the weather and the season. Where the conditions are such as to suit it the plant is a rapid grower, attaining a large size by the end of June, soon after which the blooming should commence and keep on through July and August; the flowers are proportionate in size to the leaves, varying with the greater or less vigour of the plants—from 12 to 15 inches in diameter is about their usual proportion. They are short-lived, lasting only two days; on the first day the colour of the petals is white, on the second they change to pink The plant is virtually a night bloomer, the flowers opening towards evening, and closing in the morning, opening the second time similarly for the night and closing the following morning, after which they sink below the surface, where they remain during the development of the seeds, as in the case of many other aquatics. It is a native of Guiana.

VINCA.

These are amongst the most easily managed of all stove plants; they are continuous bloomers all through the summer and autumn, producing their cheerful-looking, Phlox-like flowers from the points of the shoots in unbroken succession from June to October. They are easily propagated, not much subject to the attacks of insects, and deserve to be much more generally grown for ordinary decorative purposes than they at present are, for, save where cultivated as exhibition specimens, they are seldom met with except in a half-starved condition. Cuttings will root at any time of the year when the shoots can be had in a young state. Plants that have been cut back in the winter and have broken into growth with the extra heat applied to them as the sun's power increases will produce shoots in March fit for cuttings; take these off when about 4 inches long and put them singly in small pots in sand, cover with a propagating glass, keep moist and shaded in a temperature of 70°. They will soon root; then remove the glass, and directly they begin to grow move them into 5-inch pots. They will do in either peat or loam, but for quick-growing plants such as these we like loam best, as in it there is less disposition in the shoots to draw up weakly. When fairly established, place the plants near the light; this is of more consequence with quick-growing things, such as these Vincas, than it is with subjects that make slower progress. As soon as the tops begin to extend cut out the points to make them break several shoots; this should be repeated when further growth has been made, and when the pots are moderately full of roots move into others 8 inches or 9 inches in diameter. The soil ought to be ordinary fibrous loam, to which add about one-seventh of sand and a moderate quantity of rotten manure sifted.

A temperature that will answer for warm stove plants will suit them; give a little shade in exceptionally bright weather, with air in the daytime, and syringe them overhead every afternoon at the time of shutting up. A few sticks will be required to keep the branches open and to support them, especially towards autumn as they get larger. Plants struck at the time named and treated as above will flower by by the end of July and go on as long as there is enough warmth to keep up growth, as the blooms are produced from the extremities of the shoots while they continue extending. As the autumn advances give more air and less water, so as to get them to rest. Through the winter apply no more water than will keep the soil slightly moist, or the roots are apt to perish. This is the only weakness that these Vincas have; they cannot bear much water in the soil until far in the spring when they begin to root freely. A night temperature of 60° in the winter with some degrees higher in the day will suffice. About February cut the plants back to within a few inches of where they broke at the second stopping, tying the branches out horizontally; this will cause them to push their whole length. After they have made a couple of leaves to each break they should be turned out, and most of the soil shaken away, putting them in 11-inch or 12-inch pots, keeping the soil somewhat dry until the roots have again begun to work freely. Should the shoots appear deficient in number, the points may be pinched out as soon as they have grown 4 inches or 5 inches. Keep the plants well up to the light, and treat as to air, heat, and moisture as advised the preceding summer. All they will require is to support the branches with a few sticks and ties, and to give manure-water once a week when the roots have got full hold of the soil. These Vincas can be grown to almost any size the second year by giving larger pots and stopping the shoots a second or third time, which will have the effect of increasing the number of branches, but will also retard the flowering; or after they have bloomed for a time the shoots may be shortened, and when growth has again commenced they can be moved to larger pots, which will induce them to produce a full head of flowers. The plants may be kept on for blooming another season if required, treated through the winter and spring as in the previous year, or young ones can be brought on to take their place; these are preferable for general use, except where very large examples are wanted.

There are three varieties in cultivation:

V. alba. Flowers pure white.

V. albo-oculata. Flowers white with a red eye.

V. rosea. Flowers wholly rose coloured.

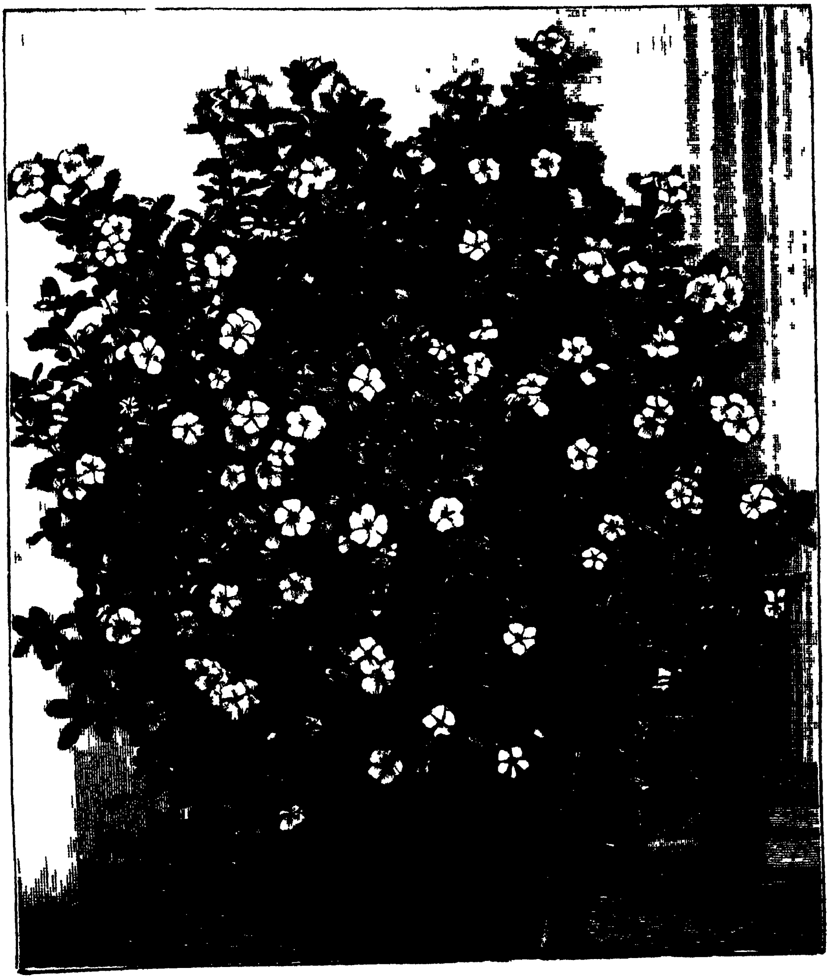
The two last are the handsomest. All three are natives of Eastern India.

INSECTS.—Greenfly and red spider will sometimes attack them, but the syringing and other precautionary measures regularly taken will usually be sufficient to keep these in check; if, notwithstanding, these insects make their appearance, fumigate to destroy the aphides, and syringe freely to banish red spider. Mealy bug will also live upon Vincas, and where present the plants should be laid on their sides and syringed freely with tepid water, and when cut back in the spring dressed well with insecticide.

WITSENIA CORYMBOSA.

This singular and distinct evergreen greenhouse plant is indigenous to the Cape of Good Hope, whence it was introduced about the commencement of the present century. It is of a branching upright habit of growth, with miniature sword-shaped leaves, from among which spring numerous corymbs of lovely pale-blue flowers produced over a long season in the advanced summer and autumn. The plant is sometimes seen in the autumn shows on the exhibition stage, where its fine colour has a pleasing effect, but from its habit of opening its blooms in succession it is better adapted for general decorative purposes. It is a slow grower, rarely attaining a size of more than two and a half feet in height by as much in diameter, consequently it does not require a great deal of pot-room. This Witsenia is a moderately free rooter, and succeeds best in good fibrous peat with a fair quantity of sand mixed with it.

The plant strikes from shoot cuttings made of the small branchlets which it produces in quantity, clothing the principal shoots with them; these should be taken off about August, cutting the base of each clean so as to divest them of jagged bark. Put them 2 inches apart in 6-inch pots filled with sand, keep close, moderately moist, and shaded from the sun, as long as requisite, in a warm greenhouse temperature of 50° in the night. During the autumn the base of the cuttings will become callused over, when place in a little more warmth, and they will root through the winter and spring; about May move singly into small pots, using fine peat with a moderate amount of sand added. Keep through the summer a little closer than is needful for large greenhouse stock. Give shade from the sun's rays when the weather is bright, but keep them near the glass, and be attentive in seeing that the soil never gets too dry; close and damp the house in the afternoons, and at the same time moisten them overhead. Give more air in autumn, and winter in a night temperature of 45°. About April move into 3-inch pots, using similar soil to that employed for the first potting. The plant is a slow grower, but as soon as the leading growth appears to be moving ahead take out the point; this will cause the shoots that will have formed about the base to move. Continue through the summer and autumn to treat as in the preceding, and winter in a like temperature. Again towards April give them a shift, this time into 6-inch pots; afterwards if any shoot takes the



VINCA ROSEA *To face page 344*

lead pinch out the point as before advised. The summer management, as also that for the ensuing autumn and winter, will need to be in every way as before, and they should be again moved towards the beginning of April into pots 2 inches larger than those they have occupied. Use plenty of drainage, as all slow-growing subjects like this are very impatient of stagnant water at the roots; pot moderately firm, and do not give much water until the roots have begun to enter the new soil. Keep the atmosphere a little close for a short time, and shade slightly during bright sunny weather all through the growing season, for if too much exposed the leaves are apt to suffer and turn brown at the points, and the plant is given an unsightly appearance. The naturally stout erect habit is such that they do not require or admit of much training, except just opening out the principal branches, which should in this way be secured to a few neat sticks; nor after this stage has been reached can much be done in the way of pinching back the shoots as they branch out naturally, further than cutting back any that are unduly taking the lead. Growth will be accelerated by closing the house through the growing season in the afternoons while the sun is yet upon the glass, and slightly damping the plants overhead, as well as keeping the atmosphere and stage upon which they stand a little moist.

The treatment which is required during the growing season will be of a uniform character, as above described, but towards autumn discontinue the use of the syringe and shading; admit more air to discourage growth before winter. Nothing is necessary in the shape of hardening up the plants, as this Witsenia is not subject to the attacks of mildew consequent on insufficiently matured shoots. Keep through the winter in an ordinary greenhouse temperature in a moderately light situation, and give no more water that is requisite to prevent the soil getting too dry. Repot in April, giving a 2 or 3 inch shift, according to the quantity of roots the plants have got, again shortening any shoots that may be outgrowing the others; this should be attended to from time to time as requisite, and none should be allowed to take the lead too much, as that would entail a waste of strength. Treat through the summer as in the season before. This autumn they will, if all goes well, bloom from the principal shoots. When in flower they can be used for conservatory decoration, and afterwards removed to the greenhouse for the winter. Repot again in spring, using the soil in a little rougher state now that the plants are larger. Continue to treat as heretofore advised, both in the growing season and when at rest; a 14-inch pot is big enough to grow them in when arrived at their full size. They will last for a number of years without repotting if manure-water is used once a week during the growing season, but the drainage should each spring be examined, as if it gets clogged up with soil the health of the plants speedily suffer.

INSECTS.—This Witsenia is not usually much troubled with insects, its hard leaves not affording much sustenance to the generality of plant pests. The use of the syringe during the growing season will keep in check red spider, which sometimes makes its appearance. Scale, both white and brown, will live on it; the white species will, if it once gets a footing, increase apace, and from the nature of the plant cannot well be destroyed by any of the usual liquid dressings, as the leaves will not bear such used in sufficient strength to kill the insect, which can only be removed by sponge and brush; these in like manner can be used for the removal of brown scale, which, however, does not increase rapidly on this plant.

WOODWARDIA.

This genus of Ferns contains greenhouse and hardy species; some of the former are noble plants when room enough is given them to attain their full size. W. radicans reaches a size of 10 to 12 feet across when planted out in a Fernery under favourable conditions, its finely arched massive fronds having few equals.

For propagation and cultivation, see Ferns, general details of culture.

GREENHOUSE SPECIES.

W. orientalis. Japan
W. radicans. Madeira.
W. radicans cristata.

YUCCA.

The greenhouse species of Yucca are desirable plants, grown for their handsome and singular foliage. They are suitable for intermixing with flowering plants in greenhouses, conservatories, or rooms, the persistent character of their leaves being such as to enable them to bear for a considerable time positions where things of a less enduring habit would suffer.

They are increased by suckers from the roots, or by pieces of the stems which, when they get old and denuded of leaves, may be cut into pieces a couple of inches long, containing two or three eyes. Insert several together in shallow pans or pots, in sand, and stand in a moderate stove heat, say 60° in the night, with a rise by day; keep the sand slightly moist, but not covered with a propagating glass. If the cuttings are put in during spring before growth begins, they will make roots and push up shoots in the course of the summer, when move them singly into pots large enough to hold them, with a moderate amount of peaty soil; keep them on during the ensuing winter and the following summer in an intermediate temperature, by which means they will make much more growth than in a greenhouse, and time will be gained. Give more root-room as required, but do not over-pot; give plenty of light and air in the daytime, with water to the roots as needed. The thick, fleshy root-formation which many of the species of Yucca produce, and which ultimately emit leaves if taken off when 2 or 3 inches long, and treated as advised for the stem cuttings, will make plants.

If well attended to Yuccas will last in good condition for many years, retaining their leaves in a healthy condition down to the base.

The following are all handsome kinds :—

Y. albo-spica. A pretty medium-sized sort. A native of Mexico.

Y. aloifolia. A green-leaved species, from South America.

Y. aloifolia variegata. A handsome variegated form of the above.

Y. concava. A handsome sort, with stout habit of growth.

Y. De Smetiana. A distinct-looking, and desirable kind, very scarce.

Y. filamentosa. A species with elegantly drooping leaves. North America.

Y. filamentosa variegata. A variegated and beautiful form of the last-named. This kind, although it will grow in a greenhouse, and in common with several others, will live out-of-doors, does best in stove heat altogether, attaining a much larger size and a more elegant curve of the leaves than when grown cool.

Y. filifera. A distinct-looking species.

Y. glauca. Has distinct glaucous leaves.

Y. quadricolor. A beautiful variegated kind, of moderate growth. Mexico.

Y. quadricolor Stokesii. A handsome form of the preceding.

INSECTS.—Insects give little trouble on these plants, but scale, both brown and white, will live on them, and where present must be removed by sponging.

ZAMIA.

Cycadaceous plants of noble appearance; their leaves, like those of the rest of the order, are of a hard whale-bone like texture, and very enduring. They rank among the handsomest fine-leaved plants in cultivation. Their cultural requirements are the same as Cycas, which see.

Z. crassifolia. A comparatively short-leaved kind, that forms a compact head. From Mexico.

Z. eriolepis. A distinct-looking species, with moderate-sized leaves, the pinnæ armed with spines.

Z. Miquelii. Leaves erect and twisted, bright green in colour; it forms a short thick stem. From Queensland.

Z. Skinneri. This forms a stem of moderate length; the leaves are from one and a half to three feet in length, not so erect as those of many of the species. A native of Panama.

ZEPHYRANTHES.

In these we have a fine genus of greenhouse bulbous plants of small growth; they produce large, handsome flowers, and are worthy of a place in every greenhouse.

They are increased by offsets which should be taken off early in spring before they begin to grow. The bulbs are comparatively small, and to make the plants effective eight or ten should be grown together; consequently half a dozen of the offsets may be put in a 4 or 5 inch pot, drained and filled with good loam and peat in equal proportions with a little sand. Stand them in an ordinary greenhouse temperature, giving plenty of light, with air in the day, and water as required to keep the soil moderately moist. Continue to treat in this way through the summer until the leaves are matured, when give less water, but never let the soil get quite dry. A shelf in a cool greenhouse will suit them best through the winter; in spring give pots a size or two larger. In potting make the soil quite solid, and manage through the summer generally as in the preceding. The plants will this season make much more progress, producing larger leaves, and increasing proportionately in size of bulbs. Winter as before, and move into larger pots in spring, but like most bulbs they must not be overpotted. Some of the strongest will most likely bloom during the spring, after which grow them on as before, and continue to treat as so far advised.

In time the bulbs will increase so as to require not only the offsets removed, but also the larger flowering portion divided: this must be done at the same season as advised for starting the offsets, before any growth is made; for if an attempt be made to separate them when the roots are in an active state they will be injured. A 10-inch pot will accommodate twelve or fourteen bulbs, which will produce a number of flowers each season, coming on in succession for several weeks.

The following are fine kinds:—

Z. candida. Flowers white. A summer or autumn blooming kind from Peru.

Z. carinata. Has pink flowers. A spring bloomer from Mexico.

Z. ochroleuca. Flowers yellow, produced in summer. From South America.

Z. rosea. A rose-coloured species that blooms in spring. From Havannah.

Z. Spofforthiana. A hybrid variety with rose-coloured flowers, produced in the early spring.

INSECTS.—Few insects affect these plants except aphides, for which fumigate.

ZICHYA.

These are evergreen climbing plants, very closely allied to and resembling Kennedyas. They are suitable for furnishing the roof of a conservatory, and require to be treated similarly to Kennedyas, which see.

The following are the most desirable:—

Z. coccinea. A scarlet-flowered, handsome species that blooms in spring. It comes from the Swan River.

Z. inophylla floribunda. Flowers yellow and scarlet; a spring bloomer. From the Swan River.

THE END.

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